The Dark Side of NASA

Missed Opportunities for Leadership and Imagination in a Bureaucracy

Paul Torrance

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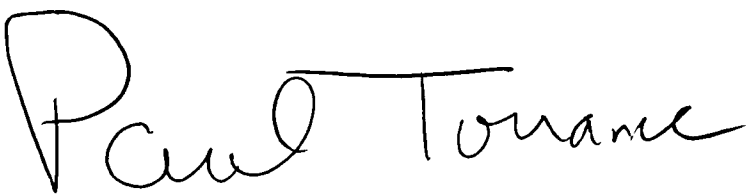

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Introduction

When someone is not feeling well, they go to a doctor. The doctor examines the patient and determines what is wrong and, hopefully, can find a cure. Quality philosophers of the 1980s talked about the deadly diseases that affect organizations. There was a big quality push in America in the late 1980s and early 1990s when Japanese cars were obviously better than the American-made gas-guzzlers. For a good part of my career at NASA, I worked in the quality organization.

I was raised by a capitalist and worked capitalist jobs all my life up to my hiring at NASA in 1985. I am sure my fellow comrades at NASA noticed my capitalist ways and inability to be as obedient to authority as the typical socialist working at NASA. After three years, I moved from the engineering directorate to SR&QA, the NASA Safety, Quality, and Reliability Directorate to become a NASA QE, a quality engineer. I learned a lot about quality and the deadly diseases that affect organizations. Over the years, I came to understand the deadly early childhood organization diseases that had been ailing NASA since its bureaucratic birth.

With my insight into NASA human spaceflight and with my quality training, I decided to write this book to explain what was wrong with NASA during the Apollo and Space Shuttle years when two astronaut crews perished aboard the Challenger and Columbia space shuttle rockets. I have given concise instances and references to reveal the deadly diseases that were ailing NASA during both the Space Shuttle and Apollo programs. These early childhood diseases have been lingering since the NASA infancy.

Sometimes infant diseases are hard to diagnose because the infant cannot describe what is wrong. I am not a medical doctor, but working inside NASA in the quality organization gave me the ability to diagnose the diseases infecting organizations.

I am careful to call the Space Shuttle a rocket even when most of my NASA comrades would say the astronauts "flew" aboard the Space Shuttle. Make no mistake about it, the Space Shuttle was a rocket, not an airplane. This was a problem at NASA: NASA managers and engineers would downplay risks and not understanding the risk and severity of the risk, as Dr. Feynman described in his addendum following the Challenger accident. What is the risk? What is *at* risk? What exactly *is* risk? Not understanding risk was a problem at NASA—not understating the stakes and what was at stake not just for an astronaut or for NASA but also for the nation—and so was not understanding what it takes to be a successful organization.

The NASA risk management system evolved largely from the United States military. The Apollo Saturn V rocket was launched less than twenty times, but the Space Shuttle—the world's most complex rocket ever built—was to be reused hundreds of times. The Apollo risk management system was in a rush and in a "learn as you go" mode to launch a man to the moon by 1969. That risk management system lingered into the Space Shuttle program. A leader was needed, but a leader never emerged to have more testing to develop confidence from testing for the most complex rocket ever built. Without confidence, there is an increase in uncertainty, and uncertainty is acknowledged in part with redundancy and backup systems for the completely unexpected. The Space Shuttle did not have the Apollo 13 redundancy built into the design and lacked testing to prove the rocket achieved 0.9999 reliability as desired.

NASA managers wanted to think they were making rational decisions and managing risk, but there was more uncertainty with the Space Shuttle design than with the Apollo Saturn V design. The astronauts truly never understood the risk they were taking. The risk, the uncertainty, and the rational and not-so-rational decision-making—these were never understood during the Space Shuttle manage-

ment era, which was the Apollo management era since no change to leadership had occurred to cause a change to management.

The concept of uncertainty deserves a lot more attention and definition than is given. If uncertainty cannot be managed, perhaps uncertainty can be refined. What are you worried about if an event outcome does not occur or does occur as desired? The politicians and bureaucrats before the Pearl Harbor and 9/11 attacks would like to claim there was a tremendous amount of uncertainty and that they were doing their jobs and had been caught off guard, but the other side of the coin is the certainty side. Regarding both Pearl Harbor and 9/11, it seems the coin was most likely to land on the certainty side, not the uncertainty side, that those attacks were going to occur.

Comrades in bureaucracy don't have to worry about risk like capitalists do. Business interruption is a common risk management concept in the insurance business, but a risk management concept I had never heard of while working at NASA; and I participated in many risk management seminars and events while working at NASA. An airplane grounded can put a capitalist airline company out of business. Bureaucratic comrades, on the other hand, know they will still have a job even if space shuttle flights are canceled for three years after an accident.

When the space shuttle was not flying or flew less, this was sometimes considered a cost-savings as the flight rates and launch costs were continuously cut back. Oops, there I go calling it "flying." At times it was hard not to be inside the bureaucracy division or branch box and to have some comrade-oddity. At times I felt like a farmer getting paid not to grow crops when NASA cut back the Space Shuttle flight rate. We, the civil servants, got reimbursed for that furlough-free vacation thanks to Congress and the president. I especially want to thank Newt Gingrich and his young Republicans who so bravely pretended they would hold the federal budget tight for my first furlough vacation. Who's pretending to hold the budget tight nowadays?

What was wrong with NASA? I diagnosed several diseases that infected the infant NASA organization. One I call Right Stuff Irrational Exuberance, also known as Alan Greenspan Disease on

Earth, named after Alan Greenspan for coining the term and commonly found at the New York Stock Exchange. Symptoms include thinking a stock market failure or rocket failure is not an option. Another disease is something I call Overgrown Infant Bureau-baby Syndrome. It is also known as bureaucrat fat brat syndrome where the leadership pituitary and thyroid glands never develop. The obvious symptoms are an organization that never develops leadership, never learns to apply any lessons beyond the next meal and crap and nap, and the inability to understand what is the right thing to do. A third disease is General Bernard Montgomery disease, also known as *A Bridge Too Far* syndrome. A fourth is *Bridge Over the River Kwai* syndrome in which managers lose focus of their purpose. I will explain when these diseases became evident in the infant NASA organization.

The Space Shuttle-era NASA was an organization that "felt bulletproof" just like the Apollo-era NASA, still acting as if NASA was in a cold war and needed to rush to do things and always without leadership from within because a president had initially told NASA what to do. In other words, the Space Shuttle-era NASA was still much the same overgrown infant Apollo-era NASA with a few improvements. A big problem through the years was not that NASA had changed; the problem was that NASA had NOT changed.

It takes leadership to cause change, not highly effective managers. NASA was always waiting and hoping to be led and told what to do. The problem was that without leadership, the management and management system at NASA has remained nearly the exact same infant management system (IMS) used to send the first twelve men (also referred to as "whiteys on the moon" in poor neighborhoods in 1969 to walk on the moon.

Defining the NASA-IMS Acronym

NASA was big on the use of acronyms, and I use the term *infant management system* (IMS) to describe NASA so often that I have added and defined that new acronym. Thus NASA-IMS refers to the National Aeronautics and Space Administration's infant management system, or NASA-IMS. The NASA-IMS was in place when I started working at NASA. The same NASA-IMS was in place when I retired twenty-seven years later with a few improvements.

Just What Is an IMS?

If I claim NASA had an infant management system (IMS) for many, many years, then it is only proper for me to define what an infant management system is. An infant management system is a management system that has no leadership at all. There will likely be highly effective and capable managers, but not one single leader. The managers will attend leadership retreats often, but never leadership advances. The managers will say there is no such thing as a leadership advance, and in their organization, this will be true; and that is one of the reasons why the managers retreat away from leadership.

In an infant management system, the managers will manage the situation at hand extremely well, just like Apollo 13 (also known as "knee-jerk reaction" management), and manage actions needed to be addressed and closed before the next meeting or next vacation or next holiday or next flight. There are usually lots of capable and effective managers in an infant management system, in part because there is no planning ahead and these managers don't know what else to do with themselves. The managers in an infant management system are often the first to open the virus-infected e-mail because they want to know everything and want everyone to know they know everything.

The management focus is completing the task at hand because there is no "success-based" leader focus upon the future and desiring to plan ahead to capture the market and to understand future customer requirements. The highly effective manager will focus upon the operation in progress whereas the leader is concerned with

research and development needed to be in business in the next five to ten years or more.

In an infant management system, one may find many managers extremely capable of the ability to write and to present PowerPoint presentations regarding current events, but there will be no leader present with the power to point managers into the direction needed to be successful in the future.

Leaders can be very dangerous. Jim Jones and Adolf Hitler were similar horrible leaders. Both were drug users. Both had bad plans for their followers, not to mention other people that got in the way of their plans. Both claimed to have a connection to God. For Jim Jones, it was a divine reincarnation; and for Hitler, it was divine providence. Both demanded complete obedience. Near the end of the war, Adolf Hitler demanded his soldiers fight to the death or their families would be killed, otherwise known as North Korean obedience. Both killed their faithful followers.

Note: Leadership and obedience have nothing in common. It is impossible for a leader to emerge from an obedient group of followers. Insect colonies have only one queen; all others are all obedient insect followers, regardless of whether they are managers or drones.

As I review books, articles, and lists that state the qualities that separate a good leader from a bad leader, I think most of those qualities are describing what separates a good manager from a bad manager. Leaders are more rare and hard to find because if they go against the management system, they will likely not get the opportunity to lead. Seems to me most leaders lead from the middle or bottom, with a manager on top picking the leader's brain to figure out what to do next because the manager does not know how to lead and depends on a lower-level leader to lead.

A good manager or leader will not have yes-men and yes-women telling the manager or leader what the manager or leader wants to hear. President Lyndon B. Johnson had a cabinet full of yes-men; and following his presidency, LBJ humbly admitted this mistake regarding advice for the Vietnam War. A good leader should

enjoy and thrive upon dissent and disobedience. If they cannot take a joke, they might not be a good leader. Any leader that claims to have a communication or appointment from divinity should scare the hell out of you.

Richard Nixon and Joseph Stalin seem to me to be similar managers and not leaders. Both were paranoid of any opposition. Nixon spied on his rivals, and Stalin simply killed all opposition. If Nixon and Stalin had traded places like Eddie Murphy and Dan Aykroyd, I imagine the outcomes would have been similar.

Mahatma Gandhi promoted his policy of nonviolence, a form of disobedience that resulted in gaining India's independence. This independence was gained only because the British Empire allowed the disobedience to occur. Imagine if India had been controlled by Uncle Joe Stalin and the Soviet Union. The Mahatma Gandhi and all his disobedient followers would have been killed or sent to Siberia or similar. The Mahatma Gandhi would have been buried in a mass grave with all his nonviolent, disobedient followers and covered up; and all traces of the event would be erased. Disobedience only results in change where disobedience is tolerated. If there is no tolerance for disobedience, then the right to bear arms is another age-old effective method of removing tyranny.

The Weeks Leading Up to the Columbia Disaster

The Mercury rocket had a launch escape system or LES by acronym. The rocket designers knew rockets were dangerous, so they included the LES in the design in case the rocket failed during the launch to hopefully keep the astronauts alive. Rockets are still dangerous today and still fail at around the same 1 to 2 percent failure rate just as rockets in the 1960s. Rockets are not highly reliable. Rockets are dangerous.

The Gemini rocket also had a launch escape system—this time individual ejection seats/pods instead of an entire crew ejection system. This is somewhat like a car using an airbag instead of a seat belt in this design. Next came the Apollo rocket, which also had a crew launch escape system similar to the Mercury capsule. The Apollo launch escape system was crash-dummy tested by NASA in New Mexico. NASA was ahead of the automakers in crash-dummy testing in the 1960s. You could say that when it came to astronaut safety, NASA was in the space age.

Note: (Each rocket labeled) "Every human rate launch rocket has had a launch escape system with the exception of the Space Shuttle."

Then something happened. The Apollo rocket era ended, and for some reason, the Space Shuttle rocket was designed with no crash-

dummy tested launch escape system. Why not? The weeks and days before the second Space Shuttle disaster (the Columbia disaster), as part of my job at NASA, I was researching and wondering how we, NASA, could be designing the orbital space place with no launch escape system. The orbital space plane was intended to replace the Space Shuttle. The plan was for the orbital space plane to not have a launch escape system just like the Space Shuttle. I knew this was not just a bad plan. Something seemed wrong. *Stupid* is another word that came to mind—a stupid design. Could it be the deadly organizational diseases were infecting NASA that the quality philosophers talked about? If the most compelling reason why humans go into space is simply to assure human survival, to simply stay alive, then why did the space shuttle not have a launch escape system?

I was reading old NASA documents, including Apollo 13 and Challenger disaster testimonies, to find lessons learned to share with the orbital space plane community and to make a diagnosis of NASA. I was looking for similarities and differences between the Apollo era and the Shuttle era. Mostly, I found similarities. Nothing had changed except for a few improvements such as in quality adopting ISO-9000 and in safety implementing OSHA VPP and the addition of Microsoft PowerPoint presentations.

I was a quality engineer assigned to the orbital space plane. I got assigned to orbital space plane likely after handing a presentation I made to the center director about six months earlier entitled "A Non-Traditional Path to Low Earth Orbit (LEO)." The day before the Columbia disaster, I sent a protest essay I had prepared for the orbital space plane community to two of my peers for peer review. The NASA plan was to build four orbital space planes to have a good cargo capacity and to have no launch escape system. I could foresee this was just another Space Shuttle program. I knew this was a bad plan for NASA, and I was going to protest—internally and politely, of course.

I knew it was just a matter of time until we would lose another space shuttle. I was 99.9999 percent certain that we, NASA, would lose another space shuttle because I had worked for several years as a NASA space shuttle quality engineer. I reviewed and worked on

many problems when I went out to California to various NASA contractors as a space shuttle quality engineer, and I worked to resolve space shuttle subsystem problems at the various aerospace contractors' facilities. Before long, I knew NASA was playing Russian roulette with American astronauts with each space shuttle launch.

I Came to Know We Would Lose a Second Space Shuttle

Probability is based on a number from zero to one. If an event is impossible and cannot occur, the probability is zero. If an event will occur no matter what, the probability is one. Benjamin Franklin said, "Two things you can be sure of are death and taxes." In other words, they say the probability of death is one and the probability of taxes is one. Conversely, they could say the probability of never being taxed is zero. Confidence is also discussed when it comes to probability. I am not sure who they are, but I am quite confident—or in other words, I have high confidence—that they are correct regarding the probability of death. Death cannot be evaded. My confidence regarding all individuals paying taxes is not as high. I learned at a young age that a man named Al Capone was arrested for tax evasion. I am not confident Al Capone ever paid his taxes, but I am fully confident he is dead by now.

Some of the conclusions I make will not be popular among people who were involved in what are essentially case studies that I analyze, especially those people who had a chance to lead but chose only to manage instead when leadership was needed or those people who chose to wander instead of strategically plan and those people who both managed and wandered into the future, hoping to get lucky or hoping success would come their way when failure was highly probable, if not inevitable. The managers were shocked, surprised, stunned, bewildered, clueless, etc. when failure occurred instead of

success, even though failure, in some cases, was almost as likely to occur as death for all and taxes for many.

For several years in the early 1990s, I was a space shuttle quality engineer for several subsystems of the Space Shuttle, namely the orbital maneuvering system (OMS), the reaction control system (RCS), astronaut tools, and life support. Before each space shuttle flight, each space shuttle subsystem manager had to close out the hundreds of reported problems at the preflight assessment review or PAR. We were not really that good at talking about problems at NASA. NASA JSC (the Johnson Space Center) was cited in the ISO-9000 quality registration for not having a corrective action system. But why did we need a corrective action system at all? We, NASA, did not have any problems with all the obedient socialists working obediently and in harmony. If there were no problems, then there was nothing to ever correct. But NASA did have problems. NASA was infected with deadly organizational diseases.

At one particular PAR, a safety engineer and the director of the PAR were discussing a problem that lasted unusually long, nearly the entire morning. The problem was with an auxiliary power unit or APU. The presenter, a safety engineer, and the director talked for an unusually long time. After the long discussions, the PAR director stated there was enough evidence to go forward to delay the space shuttle flight.

We broke for lunch from the PAR. While I was driving back to the PAR after lunch on NASA Road 1, I thought about all the space shuttle problems I had seen in California at the contractor facilities and all the problems we had to close out each and every flight. Suddenly, I felt like I had been hit by a silent cold front. I felt a chill. I remember playing outdoors as a kid with other kids when a dry cold front would come through without any forewarning. No clouds, no rain, no thunder, just a dry cold front that hits you. And all the kids would look at each other knowing something amazing and unexpected had just occurred, and suddenly, the air became ten degrees colder.

I knew that day we were going to lose another space shuttle, but when? I thought about when the next disaster would be. I was sure we

would never see 200 space shuttle flights and probably less than 150 total flights before the next space shuttle disaster. The Space Shuttle Program Office would talk about launching 400 flights through the year 2020, but I knew that was a sign of Right Stuff Irrational Exuberance, Alan Greenspan Disease. We would lose a space shuttle well before the year 2020. The roulette table can hit red and white over and over, but eventually, the ball lands on black. A black day was coming for NASA.

We did not have enough space shuttle quality up front in the design and in design testing to prove that it could manage risk. We did not have independent, redundant backup systems to help address uncertainty. We were trying to inspect quality into the space shuttle after production and after design proof testing. And there was no Apollo 13 redundant backup system for launch or for orbit.

The quality philosophers would state that as a guide, organizations should cease dependence upon inspection to achieve quality; but with every PAR and preflight review, we, NASA, were depending upon inspection to assure the space shuttle was "safe." *Safe* was another abused word at NASA. The space shuttle was a rocket, and rockets are not safe. We had a low-quality product that never met expectations.

I'd say we were flying a lemon; but it was rocketing, not flying. I'd say we were trying to assure the shuttle was safe (to fly); but it was rocketing, not flying. No matter what we did and no matter how hard we tried, no matter how much inspection was performed, the space shuttle was never safe. "Safe," "flying," "the astronauts know the risk they are taking," "the astronauts are brave explorers"—these were abused words and abused clichés used within the NASA-IMS to attempt to feel happy (utilitarianism) and to justify the not just high risk but also the overwhelming certainty of causing death to other human beings without an imminent need or cause, especially with the Cold War over. But the Cold War culture was still running NASA. With lots of excellent managers but not one single leader, no change ever came to the NASA-IMS.

February 28, 2003
The Day Before the Columbia Disaster
A Modest Proposal

"How many astronauts is NASA allowed to kill?" That's how I started my moral essay. I decided I'd put a lot of technical comparisons to ways to kill astronauts and to use the phrase "kill astronauts" and "death" many times, similar to and inspired by Johnathan Seagull's "A Modest Proposal," which proposed that people eat their babies during the potato famine in England to stay alive. There was just something wrong to not have a launch escape system in the orbital space plane. The right-stuff era was over. It was time to move on. Thus I found myself completing a moral essay the day before the Columbia disaster. I sent my essay to two of my peers for peer review the afternoon before the Columbia disaster. The following week seemed like a strange chapter of a science fiction book as I knew we would lose another space shuttle someday. I just never thought that day would be the day after I wrote an essay about killing astronauts and about how that day was coming, trying to wake up my obedient comrades at NASA.

Following the Columbia disaster, there would be the usual Columbia Accident Investigation Board (CAIB) investigation; but I knew there was a deeper, darker side to the moral of the story, and I was in the middle of that story. As the CAIB began their investigation the day after the disaster, I had just completed my investigation the day before the disaster. I already knew what was wrong with the

NASA-IMS. The orbital space plane plan to have no launch escape system was not just bad but also, in the crash dummy and safety systems day and age, it seemed unethical. I say unethical because I do not want to use the word *immoral.*

The CAIB hired a sociologist named Diane Vaughn to help in the Columbia investigation. An early childhood psychologist would have been the better choice to understand the never-ending infancy of the NASA-IMS. The CAIB looked back to the Challenger disaster and found obvious echoes. An early child psychologist would have found the same murmurs of Apollo also. The CAIB made the false assumption that the Apollo-era management system was different from the Space Shuttle management system. That was a very bad assumption for the CAIB to make. The Rogers Commission also made this same very bad assumption. Apollo 13 had lifeboats. A lifeboat at launch; a lifeboat in space. The Space Shuttle had no lifeboats. The lifeboats saved Apollo 13, not the infant management system.

I felt the plan to have no launch escape system did not meet the standard—the moral standard. This was more than ethics—this was morality. I felt like a hypocrite driving a crash-dummy tested car to work every day and then working as part of a design team proposing to build an orbital space plane that really was not a plane at all but instead just another dangerous rocket with no launch escape system and no crash-dummy testing proposed to take astronauts to work and with a cargo capacity the Aerospace Safety Advisory Panel (ASAP) recommended not having at all.

The orbital space plane launch escape system was deemed unnecessary as we were told in an OSP teleconference that the odds of a catastrophic loss were the same as the Space Shuttle, about 250 to 1. I knew that number was not correct and, even if correct, would still mean a rocket disaster at some point in time. The ASAP recommended the separation of crew and cargo following the Challenger disaster and minimizing the number of criticality 1 (CRIT 1) components to less than 10. I had been reading Challenger disaster testimonies to prepare my case. I participated in agency-wide teleconferences, hearing we were going to build a rocket with increased cargo capacity and no launch escape system. Someone had to speak up.

What about the Apollo 13 redundancy? The ASAP recommendation to separate crew from cargo? As I read Apollo 13 testimony, the deadly diseases infecting NASA were becoming more and more evident.

To write my essay, I reread a lot of old NASA reports to gain insight and to have lessons learned ready for my defense. Why did nobody else speak up? Was anyone else reading old reports to have lessons learned to apply to the orbital space plane? My new supervisor groaned a bit in the agency-wide telecom. I stated the orbital space plane had to have a launch escape system. Nobody said anything. I felt all alone as I looked deep into the dark side of NASA.

Would I be the only protester? Maybe some people would jump on board with me if I spoke up and dissented. I thought of Stanley Milgram's famous experiment on obedience. I think morality needs to be a high school course just like English and math because I think very few people know who Immanuel Kant and Stanley Milgram are. The Milgram experiment found a high proportion of people in an experiment would fully obey instructions in experiments that would cause hypothetical suffering or even death to other people, although sometimes the obedience was reluctant but still done. Milgram devised his experiment to answer the question of his time regarding if Nazi soldiers had just been following orders regarding the Holocaust. I had been reading about the Milgram experiment as I prepared my protest essay.

There were a lot of obedient military people at NASA in upper management. The military people are good at following orders, especially the jarheads. Jarheads and North Koreans are very obedient. Without leadership, the NASA managers always waited obediently like a good dog for the master president to tell NASA what to go fetch in space. I tried to imagine what it would be like if the orbital space plane had been built without a launch escape system and five years down the road, just before commissioning, the second Space Shuttle disaster occurs. What a complete waste of money the orbital space plane would have been as the program gets canceled for being such an inadequate design. Does it always take an epic Titanic type of disaster to realize the need for lifeboats and redundant systems

for ocean liners, human rockets, automobiles, trains, bridges and to address major design flaws in engineered transport systems?

It was not just a matter of the orbital space plane not keeping up with the passenger-industry moral standard. It was also NASA not applying the Apollo 13 unlearned lesson of independent redundancy in design to focus upon how to be simply successful. Perhaps success and good moral practice and ethics go hand in hand.

I think there is a great peril to being obedient. I grew up the son of a capitalist pig, and I watched the hippies protest and learned some of their songs. I always felt some comrade-oddity when among my fellow comrades at NASA. I am not saying that NASA was a bad place to work. On the contrary, NASA was rated one of the best federal bureaucracies in government to work for. I sometimes imagined Vladimir Lenin coming back from the dead and finding himself inside NASA, thinking the Bolshevik Revolution must have worked. It was pretty good socialism. We, the federalese, had good pay and good benefits even as the budget deficits soared.

The Soviet Soyuz has a launch escape system. The Chinese Shenzhou has a launch escape system. The upcoming Space Launch System and SpaceX Dragon each have launch escape systems. In the early 1990s, airbags were gaining widespread use in the automotive industry. How could the automakers continue to step forward and yet the space shuttle replacement once again be designed without a launch escape system?

Why have no launch escape system for the space shuttle? The automakers have added the airbag to complement the seat belt. Thus cars have two or more independent safety systems to assure passenger survival. Why not have two launch escape systems instead of just one in the space shuttle? Why not add the Gemini individual escape pods into the Apollo rocket crew launch escape system? As the automakers stepped forward in crew survival innovation and crash-dummy testing, what was going on at NASA? Why was NASA going back to the Fred Flintstone—vehicle stone age?

March 1, 2003

The Morning of the Columbia Disaster

On the morning of the second Space Shuttle disaster, the Columbia, I was at a Cub Scout pinewood derby. I was a cubmaster and the assistant cubmaster, Stephanie, also worked for NASA at Ellington Field. Stephanie received a phone call. She approached me and said, "The Space Shuttle just blew up over Dallas."

I said, "That's got to be a hoax. Call someone else who would know for sure, and see what they say."

Stephanie made another phone call and came back and said, "It's true. The Space Shuttle just blew up around Dallas." Stephanie had tears in her eyes and said, "I can't believe this is happening again."

She will probably never forget my response. I looked back at her and said, "I always knew we would lose another one."

This is my story as a NASA Space Shuttle-era quality engineer at the Johnson Space Center of the LES-less Space Shuttle era. This my story of the dark side of NASA. To continue my story, I need the reader to use a little imagination.

The Use of Imagination

> Imagination is everything.
>
> —Albert Einstein

> Imagination is not a gift usually associated with bureaucracies... It is therefore crucial to find a way of routinizing, even bureaucratizing, the exercise of imagination.
>
> —from the 9/11 Commission Report

Imagination is a form of thought or thinking. It seems a lot of top managers in the Oval Office and in Congress and in bureaucracy can't seem to think or imagine what they are supposed to be doing. Working to stabilize the deficit and to stabilize the nation's and world's population are rarely discussed in Washington, DC; and I never read a realistic strategic plan to put a human anywhere other than in low earth orbit while I worked at NASA.

On February 26, 1993, a truck bomb exploded below the North Tower of the World Trade Center in New York City, seven-and-a-half years before the 9/11 terrorist attack. The terrorist of that attack vowed to return to complete the task. "The system was blinking red," according to the 9/11 Commission.

Similarly, in 1925, an American military aviator named Billy Mitchell predicted the Japanese would attack Pearl Harbor and that the attack would be preceded by submarine scouts, much like the terrorist scouts checking out the airport security systems before 9/11.

In both cases, the scouts were known to be present. In the seventy years between December 7, 1941, and September 11, 2011, it seems our nation has done very little to change and to improve regarding our nation's ability to predict and to prepare for war and defense and to heed our visionaries.

Billy Mitchell the Visionary

During Space Shuttle hydrogen-leak hearings following the Challenger disaster, Senator Al Gore talked about how our political and bureaucratic managers shoot the messenger, or in other words, the visionary was like Joseph who was thrown into a well by his brothers according to the Old Testament biblical story. It is therefore prudent to take some time to reflect upon a messenger who was shot down by managers in the Army and in the Congress and Oval Office fifteen years before the December 7, 1941, Pearl Harbor attack.

Billy Mitchell was one of the great visionaries of the twentieth century. When you have a great visionary who lays out a great plan for the future to achieve success and yet failure occurs, there can only be one conclusion. That conclusion is that there was absolutely no leadership. To not succeed with a brilliant strategic planner aimed toward long-term success indicates the number of leaders present was zero at the time, just like the number of leaders present at NASA following Apollo 11 and Apollo 13 when the space shuttle was not designed to be successful.

There is a movie about Billy Mitchell's great vision, *The Court-Martial of Billy Mitchell.* If you want to be a leader and not just another manager, I recommend watching at least the court-martial trial scenes in this movie. During the trial, Billy Mitchell's letters and key recommendations to plan for the future are presented. Billy Mitchell predicts the Japanese will attack Hawaii on a Sunday morning, preceded by submarine scouts, in two air-attack waves, with a subsequent attack on Clark Airfield in the Philippines. In other words,

Billy Mitchell accurately predicted the future. After World War II, Billy Mitchell was awarded a posthumous award for his foresight by the United States, but that was much too late for the Americans who were killed by the Japanese in the Pearl Harbor attack.

I doubt both the Congress and the military wanted to acknowledge Billy Mitchell following the Pearl Harbor attack for the same reason Congress hesitated to establish a 9/11 Commission. Why? The answer is simple. Because the conclusion for not being prepared for the Pearl Harbor attack and the 9/11 attack are both due to a lack of leadership at the highest level. Who wants to appoint a committee to come to the conclusion that those who appointed the committee failed to do their job? Managers have to be very careful to choose committee members who can move the finger all around instead of pointing the finger at what failed—that being the so-called leadership, which was just management after all.

The 9/11 Commission's conclusion was quite simple: that the FBI, CIA, NSA—and let us add Congress and the president—all lacked "imagination." Is that not an amazing conclusion? Can you really expect managers to use imagination? Can managers really imagine what they should be doing other than the task at hand and the directive given? Manager's task plates and meeting calendars are always full. Managers are too busy with the tasks at hand to think about and to prepare for the future.

The 9/11 Commission Report mentions Pearl Harbor, but why there is no mention of Billy Mitchell's vision and imagination? The 9/11 Commission Report states the Pearl Harbor attack probably was not preventable. Really? I think the *imagination* term the 9/11 Commission uses to place the blame for the attack is too abstract, other than to say the managers of the NSA, CIA, and FBI could not seem to imagine what their job was and, again, the Congress and President with oversight needed spectacles to correct their vision.

What was missing was that there was no vision, no strategy, no strategic plan, and no leader to implement the plan regarding both Pearl Harbor and 9/11. Simply benchmarking Israel and other nations and mimicking or implementing similar security measures at airports and simply locking airline cockpit doors could have pre-

vented 9/11 and the birth and addition of another bureaucracy, Homeland Insecurity. Governments are quick to add fat and slow to make lean.

I know it is called the Department of Homeland Security, and I know there are security guards at many businesses; but should we not call security guards "insecurity guards" instead? We hire these guards because we feel insecure, not secure. If we felt secure, the guards would not be necessary. I am thinking we should rename our newest bureaucracy the Department of Homeland Insecurity.

Perhaps in ten thousand years, when humanity finally learns to live together and to tolerate each other, people will finally feel secure and insecurity guards and the Department of Homeland Insecurity will finally be abolished because insecurity will finally be wiped out from earth and Mars and Alpha Centauri or wherever humans have boldly and securely finally gone to. Yet ten thousand years from now, no matter how good life gets for everyone, so long as there is the right to bear arms (which there should be) and so long as there are people who commit suicide and desire to take a few other people out with them in their suicide (which there always will be), there will always be some level of insecurity in free nations.

Regarding Billy Mitchell, let's look at everyone who could have made a difference, everyone who could have rose above the ranks of just another manager, everyone who had the opportunity to lead but failed to do so. The list of managers who managed to manage and failed to lead regarding implementing Billy Mitchell's vision is long and not impressive. Managers are usually commonplace. Leaders are hard to find.

The president managing to not lead at the time was president and manager Calvin Coolidge. Judging as judges or on the jury were managing major generals: manager Charles P. Summerall, manager William S. Graves, manager Robert L. Howse, manager Douglas MacArthur, manager Benjamin Poor, manager Fred W. Sladen; managing brigadier generals: manager Ewing E. Booth, manager Albert L. Bowley, manager George Irvin, manager Edward K. King, manager Frank L. McCoy, manager Edwin B. Winans, and managing colonel manager Blanton Winship. All receive the preceding title of

manager since not one stepped forward to lead and to implement the needed change.

Douglas MacArthur was probably the best-known manager at the time who did not step forward to lead; he was known for his military management role during World War II.

Note: In the years that have passed since the Pearl Harbor attack, America was no better prepared for a similar attack seventy years later.

Imagination Case Study No. 1
The Challenger Crew Survives

Imagine what would have happened if the Challenger crew of seven astronauts had survived the Challenger launch explosion. Imagine when the rocket exploded that a launch escape system activated and the Challenger crew survived. This should not take too much imagination considering several Challenger crew members survived the actual explosion and may have remained conscious until the crew compartment fell back to earth fairly intact and made impact with the Atlantic Ocean.

The Challenger disaster was caused by a failure of the solid rocket booster O-ring seals. The space shuttle Challenger was launched at about twenty-eight degrees Fahrenheit, but the O-ring seals and joint were only designed and tested to withstand a launch temperature of at least sixty degrees Fahrenheit. The crew compartment remained fairly intact after the explosion and within seconds slowed to a free fall to the Atlantic Ocean. The impact velocity with the Atlantic Ocean surface was likely too forceful to be survivable.

Considering the Mercury, Gemini, and Apollo rockets each had launch escape systems, it should not only be easy to imagine the space shuttle rocket having a launch escape system but also difficult to imagine why the space shuttle rocket did not have a launch escape system! With automakers adding the shoulder seat belt to the already installed lap seat belt and adding airbags and increased front-impact, side-impact, and rollover safety tests, it is hard to imagine an auto-

maker going backward and removing the lap seat belt and not doing any safety tests at all. Making an automobile without seat belts and airbags and crash-dummy tests would be considered unethical. The same ethics applies to human spaceflight transportation.

Imagine the first reaction of the media, the public, and the politicians when the world sees the Challenger crew alive following the Challenger explosion. It only takes a little imagination to foresee the events that would unfold. There would be the initial tearful embraces caught on camera of the astronauts hugging their families and loved ones. Naturally, there would be a trip to the White House to meet the president. What would the newspaper headlines read? "Another Successful Failure," "Apollo 13 Déjà Vu," "NASA Succeeds Again," "NASA Inspires the Automakers Again," "NASA Still in Forefront of Space Age."

Imagine the inspiration to the coal-mining industry, to the automakers and transportation industries, to the US military and submarine program. Everyone would agree, NASA had done it again. Another Apollo 13 all over. Another successful failure. What an amazing organization. Certainly. there would be a formal gathering of the Apollo 13 crew and the Challenger crew. The senators would cry again just like Apollo 13. The Apollo old-timers would be so proud. A chip off the old shoulder. The same old NASA, still with the right stuff but even better, improved with time. Perhaps the Space Shuttle era would be called "Apollo on steroids." ("Apollo on steroids" was a slogan floating around NASA when I worked there. We were more like Apollo on a life-support respirator.)

But none of this happened. Instead of embracing the Space Shuttle era, the Apollo old-timers distanced themselves from the Challenger disaster, the natural moral distancing, not wanting to feel a part of the disaster and fatalities. "Something had changed," the NASA Apollo old-timers would claim and state before the Rogers Commission. In fact, the Apollo old-timers were so arrogant they wrote that if the Challenger launch had been on their shift, the disaster likely would not have occurred! Arrogance is a symptom of Right Stuff Irrational Exuberance.

The Apollo old-timers were blameless. How could the Apollo old-timers have any responsibility after such feats of greatness? "Hey, you, the one who put the first man on the Moon. That was amazing. Are you now responsible for this Challenger disaster? Could it be your fault?" The Apollo old-timers were consultants to the Rogers Commission. Those who sit in judgement rarely point the finger back at themselves. In America's worst wartime disaster at sea, the sinking of the USS *Indianapolis* in World War II, the USS *Indianapolis* captain, McVay, was naturally court-martialed for his failure to zigzag and failure to order "Abandon ship" in time; but the fact that Vice Admiral George Murray was one of the judges of the court of inquiry made a mockery of the impartiality of the investigation since his command was intimately involved in the disaster.

Regarding the USS *Indianapolis* sinking, the highest naval commanders failed to imagine and failed to change naval operations even though they knew the Japanese were changing their tactics and going to use Japanese submarines to sink US naval ships instead of just using submarines for reconnaissance as had been the past use. The highest naval commanders managed the situation instead of leading and making a change to US naval tactics before the sinking.

It takes a leader to make change and a visionary to foresee needed change. Billy Mitchell predicted the Japanese would attack Pearl Harbor over a decade before the attack occurred. Billy Mitchell was a visionary, but no leader was present to put his vision into motion. Billy Mitchell was court-martialed on October 28, 1925, for his insubordination, for speaking out publicly, and for his disobedience. People at the trial wondered if America owed Japan an apology for Billy Mitchell's prediction that Japan would attack Pearl Harbor. Billy Mitchell died in 1936 due to an illness.

The judge at the court-martial took a final swipe at Billy Mitchell, stating among other things, "Is this man a Moses, fitted to lead the people out of the wilderness?" A better question of the judge would have been, "Is this man a Joseph, fitted to advise a pharaoh to prepare the nation for the future?" Joseph was thrown into a well by his brothers and then into prison by a manager. In Billy Mitchell's case, it was his coworkers and managers who were at the court-mar-

tial. But Joseph, unlike Billy Mitchell, was saved by a leader. For the first time, the pharaoh met a visionary who could interpret his "seven fat cows eaten by seven skinny cows" dream and lay out a plan for the future success of the nation. There was no leader to save Billy Mitchell and to prepare the nation for the Pearl Harbor attack that killed 2,403 people. A similar number totaling 2,911 victims and 19 hijackers were killed during the September 11, 2001, attacks (9/11). If I were a sociologist, I might conclude the 9/11 attack is an echo of the Pearl Harbor attack.

That court-martial judge's question was answered on December 7, 1941, when people would look back and realize they should have listened to this amazing visionary who predicted future wars would be fought in the air. Billy Mitchell likely would have done more for America than the military wandering in the Pacific Ocean wilderness before World War II. The failure was a failure of military managers and management before Billy Mitchell spoke up publicly. No leader was available to incorporate at least part of Billy Mitchell's vision and to supervise all the worried military managers who were resistant to change.

The Apollo old-timers tried to distance themselves from the Challenger disaster, insisting things had changed. The problem was that things had not changed at NASA, and the people most responsible for the Challenger disaster were those Apollo-era heroes and old-timers. They know this is true and have come to admit NASA learned nothing from Apollo 13. The Apollo-era heroes and old-timers were the ones who could have stepped up to lead NASA and to learn and incorporate lessons learned, especially from Apollo 13, from the perspective of wanting to be "successful" again in the future.

Nobody has ever led NASA within NASA or outside NASA since inception. There are only highly effective managers at NASA pretending to be leaders but just waiting and hoping to be told what to do—hoping a president will give an executive order. The last executive order I can remember giving us any direction was President Obama's executive order not to discriminate against gays, lesbians, transgenders, and everything else under the rainbow. And the only strategic planning that was accomplished while I worked at NASA

was to strong-arm Crazy Ivan into giving up his space station Mir, and in return, NASA would give Russia financial aid.

The NASA-IMS was too infant to stand on its own and was unable to learn and to apply lessons learned. The Columbia Accident Investigation Board (CAIB) listed eight missed opportunities to prevent the Columbia disaster, but the real opportunities were missed by the Apollo-era heroes and old-timers who missed fourteen opportunities regarding Apollo 13. The Space Shuttle-era managers inherited the Apollo-era heroes' and old-timers' creation and stuck with their lemon creation, their Howard Hughes albatross—the LES-less Space Shuttle.

Imaginary Case Study No. 2
The Apollo 13 Crew Perishes

During the Apollo 13 mission, an explosion occurred in the command module as Apollo 13 was on the way to the moon. Fortunately, the lunar module that was supposed to take two of the three astronauts down to the moon was still attached to the command module. As the command module lost power and oxygen due to the explosion, the lunar module was used as a "lifeboat." This independent redundant system allowed the Apollo 13 management team and astronauts to react to the event, and the Apollo 13 crew survived. NASA stated Apollo 13 was a failure. The customer stated Apollo 13 was a success. NASA was too young to understand big words like *success* and *failure.*

Now imagine instead that the Apollo 13 mission waited just a bit longer to stir the oxygen tank that blew up. Imagine the lunar module separating from the command module and the lunar module descending to the moon. The two astronauts in the lunar module become excited as they know in just a few hours they will become the fifth and sixth human beings to step foot on the moon. As they are landing on the moon, they hear a distress signal from the command module. The oxygen tank in the command module has exploded.

Two Apollo 13 astronauts have landed on the moon, but there is no big celebration in Houston at mission control. The Apollo 13 command module is dying, along with the astronaut inside. How long can the astronaut in the command module stay alive? It is now

a question of survival or death. How long before the two astronauts on the moon are able to launch and return to the command module?

Will one astronaut die? Will all three die? One thing is for certain: if the accident had played out this way in this scenario, it is extremely likely the space shuttle would have been designed with a launch escape system—the independent lifeboat during launch similar to the independent lifeboat that saved the Apollo 13 crew. The NASA-IMS was too young and felt too bulletproof to learn and to apply this lesson to the space shuttle design.

The humble are exalted, and the exalted humbled.

Imaginary Case Study No. 3
The Columbia Foam Strike that Occurred Was Either Smaller or Larger

Imagine if the Columbia foam strike had been smaller to where the Columbia was just able to return to the Kennedy Space Center. Everyone would see the smoking hole and be thankful the crew came back safely to earth. Would everyone cheer the robust space shuttle design? Would everyone say the NASA-IMS made the right decisions? Would this be inappropriately deemed an Apollo 13-type rescue? Probably, since NASA lever learned what the Apollo 13 lesson learned was.

Now imagine if the Columbia foam strike had been much larger. Imagine half the foam falls off the main fuel tank and hits the orbiter like a hailstorm. Would this wake anyone up to make a response? What would it take to get the NASA-IMS to respond, and could the outcome have turned out any different? Even if more concern had risen, would the Columbia still be doomed?

Following the Columbia disaster, I heard there were some high-up managers discussing if an Apollo 13-type rescue could have been carried out. I knew that since nothing had been learned or applied from Apollo 13 to the space shuttle design and program, those managers did not even know what they were talking about. The highest managers at NASA did not understand why Apollo 13 was a success and what the Apollo 13 lesson learned was all about. The highest managers at NASA were clueless.

Nobody at NASA was competent to have an Apollo 13 lessons-learned discussion since the Apollo 13 lessons were never learned by NASA. This fact is probably more amazing than if we detected other intelligent life in the universe because this fact indicates I'm not sure humans are yet ready to discover there is other intelligent life in the universe. Maybe it is better to flip the uncertainty coin and ask the question of other life in the universe from the opposite approach: maybe what we will find is that there is other intelligent life in the universe that, at times, is just as dumb as we are with the same leaderless managers running alien governments and businesses with all the same problems humans seem to live for.

Imaginary Case Study No. 4
The Upcoming Second Renaissance

Imagine the world population reaching a maximum and leveling off around the year AD 2050. What will happen once the world's human population reaches a maximum and levels off or even goes down a bit? What will the world be like? The last time there was a leveling off and decline in the world population was following the Black Death, also known as the Plague, around AD 1350. What ensued and followed is known as the Renaissance, which lasted from around the Black Death until about AD 1600.

Since history has a way of repeating itself, I am suggesting a Second Renaissance is just around the corner, to begin about thirty years from now. It will be an amazing era but dangerous because even bad leaders and bad managers might seem to be doing a good job when, in fact, they are lousy and it is just the world around them getting better, making them look adequate. A Second Renaissance is not just coming but inevitable, about thirty years away. Whether we, the humans, stabilize our population or whether Mother Nature does it for us, either way a Second Renaissance is coming. With the world population stabilizing due to our own brilliance or our own stupidity—either way, the Second Renaissance is coming.

Following the last Renaissance and Industrial Revolution, people like Adolf Hitler and Joseph Stalin were able to gain power. If the quality of life improves overall for everyone everywhere during the upcoming Second Renaissance and what I think will be an Age

of Stability to follow, an age of individualism will be need to arise to minimize worldwide global government power and to assure plenty of global disobedience and skepticism and individuality.

The Newborn Infant NASA

The Problems with Infants

There are a lot of problems with infants. Infants are learning all the time, but at first, learning mainly just basic functions including such as how to eat and how to roll over. It's a great day when an infant can stand on its own two feet and take the first baby steps.

One time when I was a young boy, my older brother decided to help Mom clean the kitchen. My older brother, about six years old, brought the garden hose into the house and into the kitchen and proceeded to clean the kitchen, spraying water all over the kitchen floor. Dad had to come home. It seems my older brother and I both learned a lesson. Although my older brother was just trying to help, his actions were not appropriate. It is hard to know what is right and what is wrong to do when you are very young.

At that time, our family also had a newborn infant brother. I try to imagine my mom and dad explaining to my older brother and me not to bring the garden hose into the kitchen. Imagine my mom saying, "I hope the two of you have learned your lesson." Then I try to imagine my mom turning to my six-month-old infant brother and saying, "I hope you heard all this, too, and I hope you also learned this lesson." Of course my mom said nothing of the sort to my infant baby brother. There is no way he could learn lessons or know right from wrong. He was just an infant. Likewise, the NASA-IMS learned nothing from Apollo 13. Only a leader could have changed things, but no leader emerged.

Amazingly, this was the NASA-IMS problem when the space shuttle was being designed. The NASA-IMS was too young to know what

to do and too young to understand any lessons that could have been learned and applied to the space shuttle design. Sure, NASA learned from Apollo 13 the things to do to prepare for Apollo 14, just as an infant will eat and then crap and sleep and prepare for the next round.

The NASA-IMS The Forty-Plus-Year-Old Infant Bureaucracy

On the fortieth anniversary of NASA's inception, NASA administrator Sean O'Keefe stated, "We are in our space program infancy." I agreed wholeheartedly at the time. Forty years and NASA was still unable to stand on its own two feet and lead itself.

There are two simple reasons why the NASA-IMS has behaved like an infant for so many years. One reason is because Congress allows NASA to behave like an infant. Congress has never requested a realistic strategic plan from the NASA-IMS. The other reason is quite simple. Since a president, John F. Kennedy, initially told NASA what to do, the NASA-IMS has simply always waited to be told what to do. Why lead when all you have to do is follow? Wait for a president to say jump then just figure out how high you can jump if not told how high.

Infants cannot lead. Infants just manage to get by until the next meal or next bowel movement. In that respect, the NASA-IMS has always done a good job managing affairs until the next launch. The NASA-IMS has managed launch to launch just as an infant manages meal to meal, nap to nap, and crap to crap. And everyone is so proud of a seemingly beautiful baby bureaucracy.

There were lots of leadership retreats at the Johnson Space Center. This always made sense to me as there were never any leadership advances—only managers retreating, hoping to be told what to

do. There were lots of highly effective managers in the NASA-IMS but never a leader. Not one leader ever in the NASA-IMS. If a president initially told NASA what to do, it only makes sense that the NASA-IMS would always wait to be told what to do.

The NASA-IMS Missed Leadership Opportunities

Missed Leadership Opportunity No. 1
What's Next After the Apollo 11 Splashdown?

On July 24, 1969, the first man to walk on the Moon, Neil Armstrong, safely returned to earth. A new vision and new leadership was opportune within the NASA-IMS. This was NASA's first big missed opportunity to lead, to come forward and lay out new long-term plans to Congress and to the president. But how could NASA possibly lead itself? Didn't it take a president of the United States to declare the lunar program? How could anyone within the NASA-IMS dare to suggest a new path for NASA? Plus it is easy to pretend you are leading NASA when the truth is you are just following along with everyone else, waiting for a president to tell you what to do. We had lots of managers at NASA that fellow comrades would proclaim to be leaders, but what did they ever do other than implement the plan and budget handed to them?

In sales, you have to understand your customer and know when the market is changing to stay competitive. With the Cold War victory over, politicians would no longer be as willing to accept dangerous risks. Also, the "end of the decade' deadline was over. The rush culture could now be transformed. But there was no leader to analyze the customer and to change to satisfy the customer. The managers continued down the same path.

There was a big problem regarding leadership being able to emerge from within the NASA-IMS. The problem was that the

potential leaders to choose from were not the best qualified. The potential leaders available were part of the right-stuff era astronaut club or were in support of that clique where you show your guts and maybe get your photo posted at the drinking establishment with the pictures of other dead heroes if your experimental plane crashed and burned. You had to be social and close to those flying comrades to have upward mobility into management.

The problem was that a new type of leader was needed at NASA in human spaceflight because the right stuff had philosophically ended. The right-stuff era was over, but the right-stuff era management system remained. A leader would have realized the customer requirements for success had changed and looked for new visionaries. Instead, nothing changed in the NASA management system.

What would a leader change inside the NASA-IMS following Apollo 11? For one, the agency had been in a rush to beat the Russians to the moon. But now the moon rush was over. The rush culture lingered, but now it was a pretend rush. A good first step would be to end the rush culture and to transform NASA into a more developmental agency and develop a safe, low-cost, very reliable rocket simply for human transport to and from low earth orbit without cargo. That is not a glorious task. No guts, no glory. No need for the right stuff controlling the NASA-IMS. Next would be low-cost, mass-produced mini-space stations to control cost and manage risk and deal with uncertainty. A two-person mini space station, if developed and cost-effective, could be linked in Apollo 13 "lesson learned" fashion and used in multiple mass-production numbers to return cheaply to the moon and to go to Mars. But without leadership and change, the rush culture prevailed and continued into the space shuttle era.

The old cliché "the astronauts know they risk they are taking" would thus continue, but the cliché was no longer true once Apollo 11 ended, if not before. Just as "Black lives matter," or at least began to in the 1960s, it turned out "Astronauts' lives matter" now as well. Immanuel Kant developed the "categorical imperative," always making sure that we try to treat people as ends and never as means. If Apollo 11 astronaut risk was due to a war, even if a cold war, then

perhaps the astronaut risk was necessary to win the battle and war to get to the moon first. Once the battle and Cold War was over, astronauts needed to be treated as ends and not a means. This is similar to soldiers in peacetime: soldiers are not killed in peacetime, and their families are subsequently reassured by saying, "The soldiers knew the risk they were taking. We are at war, you know, and we must win." It was now absurd to say the astronauts know the risk they are taking in a government program not at war.

I assume Christopher Columbus was called a brave explorer in his time. If all Columbus ever did was to sail back and forth from the coast of Africa to the Canary Islands and had never gone beyond, I doubt he would have been considered a brave explorer. Likewise, if all the space shuttle ever did was to travel back and forth from earth to low earth orbit and never beyond, were the space shuttle astronauts brave explorers who knew the exploration risk they were taking? Or were they just a variety of ordinary people going back and forth to work? I wonder, was the Apollo rush culture lingering at NASA, and was the space shuttle design ethical for the space age of humanity?

The human spaceflight business had changed, but there was no leader in NASA to change the business and to change the business model going forward; only reactionary managers in an IMS unable to change on its own.

In 1973, the Oldsmobile Toronado became the first passenger car with an airbag intended for sale to the general public. As the automakers were taking small steps toward improved passenger safety travel on earth, NASA was about to take a giant leap backward and build the most complex experimental human-rated rocket ever, and for the first time, have no launch escape system in that dangerous, complex, experimental rocket.

Plato stated one of the problems of government is the ability to plan ahead. Democracies must make popular decisions and appease voters for the current event. Thus our current huge federal government deficit and annual budget deficit spending. Part of the Apollo program success was the leadership and vision that created a long-term plan to develop the Apollo rocket and lunar program. A rocket

visionary named Wernher von Braun laid out the plan, and the politicians carved out the work programs' pie around that plan.

But once the Apollo program ended, there was no long-term engineering plan, and the political jobs' program pie was already carved. Thus the space shuttle solid rockets would provide jobs in Utah but have to be built in segments to ship to the jobs program in Louisiana, and then be assembled there and shipped on the jobs program barge in Mississippi to launch at the jobs program in Florida. The Challenger disaster O-ring failed due to cold weather, but you have to wonder what would have happened if the solid rocket had been built in Florida as one continuous rocket without any segments and without any O-rings. It would be hard for an O-ring to fail and to cause a disaster if there is was no O-ring in the first place.

Missed Leadership Opportunity no. 2
The Failure to Build Upon Apollo 13 "Success"

If there was ever an opportunity for leadership to step forward within NASA or in Congress or in the Oval Office for the light bulb to turn on inside the head and brain of a leader to lay out the path for future success at NASA, it was following Apollo 13. Managers want to be told what to do. Leaders want to be successful. Apollo 13 defined future success for NASA, but the NASA-IMS was too young to know the definition of success. Apollo 13 has been called a successful failure, but Apollo 13 (from a leadership standpoint) was a failed success. No leader emerged to apply the success of Apollo 13 to the future to build spacecraft to assure the success of the NASA-IMS.

Before the US Senate, the NASA managers kept calling the Apollo 13 mission a failure. The senators kept calling Apollo 13 a success. The leadership light bulb should have turned on inside the head of a leader at NASA when Senator Curtis made the following statement: "Dr. Paine, I want to take exception to one statement you made in your presentation. You referred to what has happened as a failure. I would rather describe it as an accident and accept that as not a failure." This was an opportunity for a NASA leader to emerge. Instead, nothing changed in the NASA-IMS, and nothing was learned from Apollo 13.

Note: "The Apollo 13 mission was a failure. I see no reason why this setback should be—or should be made to be—the occasion for a major change in the course of the nation's space program" (NASA Administrator O. Pain following the Apollo 13 accident).

"Dr. Paine, I want to take exception to one statement you made in your presentation. You referred to what has happened as a failure. I would rather describe it as an accident and accept that as not a failure."

With no leader present to lead NASA toward "success," the mistakes of Apollo 13 became the mistakes of the Challenger disaster without change. Then again, without a leader and without change following the Challenger disaster, the mistakes of Apollo 13 repeated and became the mistakes of the Columbia accident.

Just how successful was Apollo 13? Some of the senators at the Senate hearing were in tears, calling Apollo 13 perhaps the greatest success stories ever. Television and radio coverage of the Apollo 13 splashdown was likely at the highest peak for any single event in history, apparently surpassing even that of the actual first walk on the moon by Apollo 11.

There were no leaders listening to the customer to focus the NASA-IMS upon future human spaceflight success, only NASA-IMS managers. Dr. Paine, the NASA administrator, had already stated, "We will conduct this investigation, but I see no reason why this setback should be—or should be made to be—the occasion for a major change in the course of the nation's space program." Spoken like a true manager. The verdict was already out. Reminds me of a John Wayne movie where the Duke says, "We'll give them a fair trial in the morning and hang them in the afternoon." Thus there was no change when change was needed most.

Note: The Apollo 13, 1983, Soyuz and 2018 Soyuz spacecraft each had has an independent redundant system to allow survival. The Challenger and Columbia spacecraft had no independent redundant system to allow survival.

Note: The Challenger and Columbia disaster investigators, in both cases, assumed that things had changed and become worse in the NASA management system following the Apollo program; but with Apollo program personnel advising the space shuttle accident investigations, this was just a form of moral distancing and a typical knee-jerk management reaction. In truth, the Apollo 13 accident had more documented missed opportunities than the Columbia accident (thirteen versus eight). It was the same management system with some improvements with time, not the opposite. The spacecraft design and lunar lifeboat that allowed Apollo 13 success was a "how to be successful" lesson that was not learned and not designed into the space shuttle to allow similar success.

I attended the forty-fifth year celebration of the Apollo 13 mission at the Johnson Space Center. At one point, Jeff Kruger, the moderator, asked a simple question to the distinguished Apollo 13 panelists: "Did you (the NASA-IMS) learn anything from Apollo 13?"

Following an awkward pause, one of the panelists finally gave the honest answer that I knew was forthcoming. "No!" was the simple answer. The audience laughed at the "No!" answer, but I did not laugh. The panelist was being serious, and I knew he was being honest. He had no reason to lie. I don't think the NASA audience realized how serious he was, but I knew he meant what he said. And nobody at NASA begged to differ. Thus you do not have to trust me when I state NASA never learned anything from Apollo 13. You can simply trust the Apollo 13 distinguished panelists.

Sure, there were the changes to prepare for the next mission, Apollo 14, like having the lunar module and command module lithium canisters that scrub carbon dioxide be compatible, which should have been another lesson learned in the need for redundancy. Just as an infant is washed and fed and cleaned and prepared for the next round, nothing was learned from Apollo 13 and applied to the future space shuttle design. The NASA-IMS was too young to understand the difference between success and failure.

No NASA-IMS or political leader was present to realize just how successful Apollo 13 had been and why. Nothing was learned

to prepare the future programs to be successful. The NASA-IMS was too young to understand the word *success* and not ready for mathematics to calculate the probability of success.

Missed Leadership Opportunity no. 3
The Space Shuttle Design Shortcomings

In the October 1981 issue of *National Geographic*, the space shuttle is described as an airplane and not a capsule or command module. The article notes that NASA's other spacecraft systems—Mercury, Gemini, and Apollo—were all crash-dummy tested by sending shells into space without pilots. The flying fraternity of test pilots is discussed in the article.

Those astronauts in the fraternity knew the danger of flying experimental aircraft. But the truth is, those days have passed. The right-stuff era was over. NASA would soon pretend it was still in the right-stuff era and also in a "lots of stuff" era. Test pilots could now mix with mission specialists and schoolteachers and politicians and citizens with money flying into space. But none of that was true. The right-stuff era was over, and NASA was not developed enough to be safely in a "lots of stuff" era. The space shuttle was just the next rocket, and this time, a rocket without a crash-dummy unmanned-shell test like its predecessors.

The space shuttle did have two ejection seats for the first four flights, but the ejection seats were never crash-dummy tested and would not have worked during initial launch. While virtually all other high-speed aircraft over Mach 1 speed had crash-dummy tested ejection seats and all other nations rockets had shell-tested launch escape systems, the NASA-IMS without leadership and vision for the future was about to fall behind the automakers and virtually all

other passenger-travel systems made by humanity regarding passenger safety and crash-dummy testing.

With the space shuttle built and program in place and jobs programs rolling, only a leader would be able to change the bureaucratic path and jobs program gripping its hold upon the federal budget. Only a leader could lead the bureaucracy away from failure and toward success. It would be extremely difficult to convince the organization that just put the first man on the moon that anything they were doing at all was less than amazing. The show must go on. Act 1 of the first man on the moon was over. Now the most amazing juggling act was onstage—a vehicle that could do everything: launch cargo, launch satellites, launch people, allow extravehicular activity (EVA), do experiments, and fly like a reusable airplane forty-eight times a year. The only problem was the political show was over. The right-stuff era had ended, and NASA was reminiscing with act 2.

In 1979, the National Highway Traffic Safety Administration (NHTSA) began crash-testing cars and making the results public. As the automakers and the government oversight stepped forward, NASA stepped backward and built a space shuttle without a launch escape system and without crash-dummy testing and without Apollo 13 redundancy.

As Astronaut Jack Lousma once stated:

> The Apollo Command Module had a launch escape system. If you needed to save your life on the launch pad you could fire it, and it would rocket you up 5,000 feet and a mile out to sea. But the Shuttle didn't have anything like that. So one of the basic differences was the risk we were taking. I felt a lot more risk flying the space shuttle than I had flying the command module on the Saturn rocket for my Skylab mission in 1973.
>
> The shuttle did have ejection seats for the first four test flights, but they weren't really made for use during launch—their prime purpose was for

> an emergencies during the approach and landing at the end of the mission. There were some phases during the ascent where they might have been useful, but it was never clearly defined what they were. It wasn't useful on the launch pad. You'd have hit the ground before you had the chute open. During other parts of the launch profile you might have ejected into the exhaust plume of the rocket, or your parachute might have opened prematurely due to the overpressure from an explosion after ejection, or who knows what. I was never able to get any definition as to when it might be possible to safely use them during launch.

Never being able to get any definition as to when it (the ejection seat) might be possible to safely use means the risk was not known and not quantified. Thus when I would hear the cliché "the astronauts know the risk they are taking," I was pretty sure the astronauts actually did not know the calculated risk they were taking. Only Nobody from the spaghetti Western movie *My Name Is Nobody* truly knew the risk the astronauts were taking.

Missed Leadership Opportunity no. 4
The STS-5 Safety Compromise

STS-5 and the impact of the Apollo-era infant management and rush culture was the last clear opportunity for a leader to emerge to stave off the Challenger disaster. The STS-5 management, instead of leadership decision, would set the stage for the first space shuttle disaster. Rockets being rockets, soon the roulette wheel would land on black, and there would be no Apollo 13 lifeboat designed into the space shuttle. The space shuttle would launch without any type of launch escape system even as the automakers were adding airbags to vehicles and crash-dummy testing said vehicles for transportation on earth. The Bruce Springsteen song "One Step Forward, Two Steps Back" comes to mind. In Apollo language, it would be "One small step forward for the automakers, two large steps back for NASA."

As Captain James A. Lovell would state following the Apollo 13 mission, "I must have been as good a target for the law of averages as anyone. The turn of the dice came up, and we did have an accident. We then had problems, and they were serious. But we are going to have these things in the future. If we had had this kind of accident on Apollo 8, Frank Borman, Bill Anders, and I would now be long dead. We had no lunar module on that flight and, therefore, no reserve power."

According to NASA, the test pilots in the risk-takers fraternity, after four space shuttle launches, had proven the space shuttle was as safe as an airplane that anyone could now fly on. That was the

thought pattern of the NASA-IMS as the two unproven ejection seats were removed and the space shuttle declared operational to begin STS-5, the fifth space shuttle launch.

Declared operational? Who was qualified to make that decision? Automobile safety tests are guided by a national transportation safety board. Who was questioning NASA? Sometimes risk-management decisions and uncertainty evaluations are not done or poorly made because the people making the decision either do not understand the risk and consequence or they are not qualified to make the decisions or both.

When Napoleon invaded Moscow, he felt certain the citizens of Moscow would return and give Napoleon the key to the city. The citizens did not return, and Napoleon suffered his worst battle loss during the retreat. As a result, US civil war generals who studied Napoleon were afraid to advance very far at the start of the Civil War lest their supply lines got cut off like Napoleon. When the Challenger and Columbia disasters occurred, investigators felt certain any advice they got from the Apollo-era managers was valid and felt certain the management system of Apollo and the space shuttle were different. Skepticism of what is thought to be valid or true can aid in figuring out what is certain and what is uncertain and how to deal with the uncertainty if it is even possible and if even necessary. Unexpected loss does not necessarily cause extinction. A total loss of a vehicle with safe passengers may be meaningless. A vehicle not suffering a scratch that runs over a pedestrian may be hard to endure.

Some act of Congress should have been required for this decision. This was a missed opportunity for a leader to emerge in the Oval Office, in Congress, or at NASA. No leader emerged anywhere. Newt Gingrich once said that if it wasn't for bureaucracy, NASA would have been to Mars and back by now. Newt forgot to include Congress and the Oval Office in his statement. There was no leadership anywhere.

It appears the decision to remove the two ejection seats and to declare the space shuttle operational was made at the Space Shuttle program level. This would be similar to allowing automakers to decide for themselves if the automaker wanted to remove seat belts

from cars to make the car cost less and weigh less. After all, the drivers and passengers know the risk they are taking. That is the cop-out slogan that was used inside the NASA-IMS: when all else fails, you can simply say, "The astronauts know the risk they are taking."

The decision to remove the ejection seats and to have no launch escape system should have been approved by an act of Congress similar to the National Transportation Safety Board requirements for automobiles. But nobody was leading the NASA-IMS to be a successful growing baby bureaucracy. Nobody in NASA was leading NASA, nobody in Congress was leading the NASA-IMS, and nobody was leading NASA in the Oval Office. Without vision and leadership, NASA was drifting into an unimaginable and dangerous place in space.

The space shuttle was already over cost and not going to meet the original goal to provide forty-eight low-cost flights to orbit each year. Only a leader could convince any bureaucracy beginning to dig its congressional funding heels deep into the federal budget to change course.

The STS-5 NASA-IMS decision to remove the two ejection seats from the Space Shuttle set the stage for what was a highly probable if not completely inevitable "failure," rockets being rockets and all rockets failing occasionally.

It was during the STS-5 decision that a deadly infant management disease became apparent, namely *Bridge Over the River Kwai* delusion. Symptoms include forgetting or never knowing your purpose with the inability to have a clear vision of what to do other than seeing what is within a few feet of you. It is definitely a shortsightedness management disease. The best-known remedy is simply to stop and to ask the question "Remind me again what we are doing here?" or similar questions such as "Are we really going to do this?" Or perhaps "Where is this going to get us to?" Questions like these, similar to the British commander's self-assessment at the end of movie *The Bridge On the River Kwai*, are needed to prevent or to end *Bridge Over the River Kwai* delusion.

Note: When organizations forget their sense of purpose, they may be suffering from *The Bridge Over the River Kwai* syndrome.

When Jim Lovell was interviewed regarding Apollo 13 for the *Life* magazine April 24, 1970, issue, the full-page cigarette advertisements did not have the surgeon general's warning that smoking was hazardous to your health. But by the STS-5-decision era, the surgeon general's warning was everywhere. Smokers knew the risk they were taking, but smokers' lives were beginning to matter. Federal office buildings would ban smoking inside the buildings to eliminate secondhand smoke. Even nonsmokers' lives were mattering more than before. The astronauts were driving cars with airbags to work unlike in the 1960s. Thus astronauts' lives mattered more than before, at least on earth's surface.

Women and minorities were becoming astronauts. The OSHA Voluntary Protection Program was being implemented in government and in industry. Everywhere peoples' lives and workers' lives mattered more, and the risk people took was being reduced. About this time, the state of New York in 1984 passed a law requiring all passenger cars to have seat belts. Following the grounding of the Exxon Valdez oil tanker in 1989, all tankers calling at ports in the United States were required to have two hulls—the Apollo 13 independent redundancy. Before the loss of the Titanic, passenger ships were not required to carry enough lifeboats for all passengers; and if a passenger ship did have lifeboats, the culture in the early 1900s was to wonder if something was wrong with the ship for the ship to have to need lifeboats. But at NASA, the risk the astronauts were taking was increasing because the long-ended race was still considered and pretended to be, and the lingering rush culture pretended to remain ahead of some undefined and unplanned future.

Twice the Russian Soyuz Launch Escape System Has Saved Human Lives

On September 26, 1983, for the first time in the history of human spaceflight, a launch escape system was activated with a crew on board, saving the lives of the Commander Vladimir Titov and the flight engineer Gennady Strekov, the two-cosmonaut crew. On launch, the Soyuz 7K-ST no. 16L's launch escape system fired two seconds before the rocket exploded on the launchpad. The launch control team activated the launch escape system; but the control cables had burned through, and the Soyuz crew could not activate the system themselves. If not for an Apollo 13 unlearned lesson level of the redundancy backup system—a backup radio control system requiring two independent radio operators—if not for that backup system to activate the launch escape system, the crew would have perished.

It is said the cosmonaut crew's first action after the escape rocket fired was to deactivate the cockpit's voice recorder because the crew was swearing a lot. The launch escape system was recovered about four kilometers from the burning launchpad, and the crew immediately asked for cigarettes and were given shots of vodka. Thus at the time the NASA-IMS was preparing to completely eliminate any launch escape capability at all from the space shuttle, for the first time, a launch abort system had saved the lives of two human beings.

On October 11, 2018, a Soyuz launch escape system would once again save the lives of two human beings—this time an American

astronaut and a Soviet cosmonaut. On October 11, 2018, at 1 minute and 24 seconds into the 139th flight of a Soyuz spacecraft, flight Soyuz MS-10, one of the four Soyuz-FG rocket boosters failed. The Soyuz launch escape system was activated, and the two-person crew of cosmonaut Aleksey Ovchinin and astronaut Nick Hague both survived unharmed.

Missed Leadership Opportunity no. 5 The Challenger Disaster and Decision to Reinforce Failure with Failure

The NASA-IMS fifth missed leadership opportunity was the Challenger disaster and decision to build a replacement orbiter. This showcases the NASA-IMS inability to learn from failure.

Reflecting back upon the Rogers Commission: On June 10, 1986, the Rogers Commission that was formed to investigate the Challenger disaster presented its report before the House Committee on Science, Space, and Technology. I read this testimony as I was preparing lessons learned for the orbital space plane (OSP) debate I knew I would be getting into as I would have to defend the design need for a launch escape system since no escape system was planned for the OSP. There were four statements in the Rogers Commission testimony that stuck out to me:

1. The Rogers Commission was "troubled by the propensity of management at Marshall (the Marshall Space Flight Center) to contain potentially serious problems and to attempt to resolve them internally rather than communicate them forward." This did not surprise me since we at NASA JSC did not achieve the quality ISO-9000 registration until the ISO-9000 finding that a corrective action system was needed was imple-

mented. A corrective-action system? Why would JSC need a corrective-action system? Would that not indicate that there might be problems to resolve? It seems we were not very good at discussing problems within the NASA-IMS or even admitting we had problems when, in quality-management theory, discussing and bringing forward problems is one of the basic points to having a quality management system with continuous improvement.

2. The Rogers Commission stated, "The Space Shuttle program, like its predecessors Mercury, Gemini, Apollo, Skylab, and Apollo-Soyuz, is clearly a developmental program and must be treated as such by NASA." If this conclusion is valid, then why was a launch escape system not installed into the space shuttle like its predecessor programs? Why go forward without an LES?
3. The Rogers Commission encouraged the transition of qualified astronauts into agency management positions. But the problem is, the astronauts are the most likely to accept risk when risk-taking was on the decline in all transportation industries. Only a leader could have changed the course of the NASA-IMS and could have opened the eyes of the NASA-IMS to a new vision. It is doubtful that new leader would be a right-stuff era astronaut.
4. The absolute wrong conclusion and worst cheap shot at NASA the Rogers Commission took was to state, "The unrelenting pressure to meet the demands of an accelerating flight schedule might have been adequately handled by NASA if it had insisted upon the exactingly thorough procedures that were its hallmark during the Apollo Program. An extensive and redundant safety

> program comprising interdependent safety, reliability and quality assurance functions existed during and after the lunar program to discover any safety (problems)." Between that period and 1986, however, the program became ineffective.

Thus the Rogers Commission was implying that if only Gene Kranz and his Apollo 13 team had been there doing things their hallmark way instead of Linda Ham and the ineffective Space Shuttle program, then the Columbia disaster likely never would have occurred. Obviously, Apollo-era heroes were advising the judges and jury, morally distancing themselves as far as possible from death of seven astronauts and their fair share of the responsibility. In fact, the Apollo old-timers had the most opportunity to lead and to change the NASA-IMS early on, but nobody stepped up to lead and to change the NASA-IMS. Thus the problems of Apollo 13 became the same problems of Challenger, which became the space problems of Columbia because nobody has ever changed the NASA-IMS; and without change, the same diseases linger in an IMS with a rush to do things and go ahead and take unnecessary risk culture.

Note: The flight Apollo 13 and Columbia management teams operate virtually the same, and all are trained professionals. Yet the Apollo 13 team members are considered heroes and motivational speakers but not so regarding the Columbia team. The main difference was the hardware and lifeboat that allowed the Apollo 13 crew to survive, a lesson that was not learned and not passed on to the space shuttle design.

There were more mistakes and missed opportunities in Apollo 13 than in the Columbia disaster (thirteen versus eight), and some of the early actions of the Apollo 13 flight control nearly caused more harm than good. If not for the lunar module lifeboat, the Apollo 13 crew would have perished and Apollo 13 perceived heroes—alias knee-jerk reaction managers—would not become motivational speakers. Perhaps NASA would have learned a lesson and built a lifeboat

into the space shuttle or next spacecraft to come if Apollo 13 had perished. Perhaps with the lifeboat, the Columbia crew would have survived and Linda Ham would become the motivational speaker, not Gene Kranz. The truth be told, Gene Kranz and Linda Ham were much the same trained professionals doing their jobs almost exactly the same since the NASA-IMS has hardly changed at all over the years except for some improvements here and there. The hardware was the difference that allowed success, not the knee-jerk reactions.

Reinforcing "Failure"—the NASA-IMS Diseases Becoming Very Evident

One of the oldest military axioms is "Never reinforce failure." Yet reinforcing failure is exactly what the NASA-IMS did following the Challenger disaster, which could also be called the Challenger failure if the NASA-IMS had only known what the words *success* and *failure* meant. The NASA-IMS replaced the failed Challenger orbiter and built another orbiter almost identical to the other orbiters. Since the NASA-IMS did not know the difference between success and failure and what it takes to succeed, it is no surprise that the NASA-IMS would reinforce failure with failure. At this time, the Aerospace Safety Advisory Panel stated there was a lack of a national consensus as to what should be the goals of the civil space program. In other words, there was no strategic plan, no vision for the future. With no strategic plan, with no vision, and with no imagination, it is not surprising that the NASA-IMS would reinforce failure with failure.

With the loss of the space shuttle Challenger, the symptoms of Right Stuff Irrational Exuberance, one of the deadly infant management diseases the NASA-IMS suffered from, would begin to show obvious symptoms. Though not easy to diagnose, it was at this time that NASA administrator rear admiral Richard Truly stated, "The Columbia first flew in 1981. I have no doubt it will still be flying in the year 2005." Yet the Columbia was lost in the year 2003. There is no consolation regarding the Columbia loss, but the Columbia was unable to service the Space Station. The Columbia was too heavy. A

loss of one of the other orbiters instead of the Columbia would have been much worse for the multinational space station construction and operation. Only two orbiters would have been available to service the multinational space station instead of three had a different orbiter crashed instead of the Columbia.

The only known remedy to Right Stuff Irrational Exuberance is leadership and vision restoration. NASA Administrator Truly's comments were made in a large, very oversize return-to-flight booklet *Space Shuttle: The Journey Continues*. The oversize booklet is another sign of the bragging exuberance culture. The NASA administrator stated, "The shock and grief of Challenger never affected our determination to rebuild and fly again." Of course not. That is the test-pilot culture: to be brave and next in line. The problem was the right-stuff era was over, and it was no longer a test-pilot culture decision for the NASA-IMS to make. And of course, the space shuttle was rocketing, not flying.

How bad was the Right Stuff Irrational Exuberance in the NASA-IMS? Perhaps a more extreme case was the British prime minister Neville Chamberlain who flew to meet with Adolf Hitler and then returned to England on September 30, 1938, waving a piece of paper—a signed peace pact with Nazi Germany. Chamberlain stated, "I believe it is peace in our time. Now I recommend you to go home and sleep quietly in your beds." Eight months later, Chamberlain was forced to resign as World War II broke out.

The NASA Space Shuttle Program expected to fly (there's that word again) the space shuttle until the year 2020, with four hundred flights with lower operating costs and increased safety, to build a space station. This was irrational exuberance.

The Imaginary Story of the Child that Thrice Fell Off Its Bicycle

To give another perspective to the story of how Apollo 13, the Challenger disaster, and the Columbia disaster all fit together is the imaginary story of the child that thrice fell off its bicycle.

Once upon a time, there was a young child that was given a tricycle. Upon attempting to ride the tricycle, one parent stayed on either side of the child to prevent an injury to the child. The child also wore a helmet, kneepads, elbow pads, and long pants and a long-sleeve shirt in case of a fall. Sure enough, before too long, the child fell off the tricycle; but expecting the fall, a parent was there to catch the child. The tricycle was badly damaged, but the child was unharmed.

"You failed us!" exclaimed both parents, looking at the child. "We wanted our neighbor Crazy Ivan to see you!"

The next-door neighbor spoke up and said, "Actually, this looks like quite the success story. The tricycle is ruined, but the child is fine. And that's all that really matters. These things are going to happen." An investigation team noticed the handlebar was a bit loose. The child listened but was simply bewildered, still trying to learn how to ride the tricycle and not having any idea at all what big words like *success* and *failure* meant.

A week later, the parents gave the child a new bicycle, but out to prove just how special their child was compared to the new Russian immigrant next door whom everyone simply called Crazy Ivan and who also had a child on a tricycle, the parents gave their child a

unicycle. They also gave their child a very large backpack to carry a hundred pounds of cargo with while riding. Also, while riding, the parents gave the child three balls to juggle while riding hands-free. It was an amazing circus act to watch.

Somehow, the child did amazingly well carrying a hundred extra pounds and juggling three balls while riding the unicycle. But after a while, the child fell; but this time, Mommy and Daddy were not there to catch the child. There was no Apollo 13 independent redundancy this time. The child had no helmet and was barefoot with a short-sleeved shirt and shorts.

The child was badly hurt, and the unicycle was damaged. An investigation team noticed a spoke was not manufactured properly and was likely the cause of the accident. The neighbor looked on somewhat amazed at what the child was capable of doing but not amazed at all that the accident happened. The neighbor could not help but say something. "Are you sure your child is ready for a unicycle? And don't you think your child could use a helmet? Other kids wear helmets."

"Nonsense!" responded a parent. "No guts, no glory! We are beyond all that and in the operational phase now."

The parents replaced the unicycle with an exact same new unicycle but with a new spoke. After a few amazing pedals down the street, the child fell again and was badly hurt, and the unicycle was totaled. An investigative team returned and concluded a bicycle pedal had been hit and damaged. This time the investigating team brought a sociologist who told the investigating team she saw echoes of the accident that had occurred the week before. Everyone marveled at the talent of the sociologist to see that the two accidents had much in common. Nobody else could have figured that out.

The neighbor could not help but say, "Don't you think you might be getting a little ahead of yourselves? Or at least give your child a helmet?"

The parents looked back a bit annoyed this time. "Mind your own business. No wimpy kids in this family. No guts, no glory. Want to see a kid with a helmet? Go watch Crazy Ivan's kid. Just an ordi-

nary bike. And that kid always wears a helmet. How boring, and what a wimp."

The neighbor wasn't sure which neighbor was more insane: the Russian Crazy Ivan or the American flyboy. The neighbor had watched the Russian and the American try to outdo each another for so long the neighbor was pretty sure neither one could remember why they had started feuding in the first place.

Missed Leadership Opportunity No. 6
July 10, 1990
The Space Shuttle Hydrogen Leaks

Doubts arose regarding the NASA-IMS right-stuff era Apollo management system following the Challenger disaster after return to flight. Space shuttle hydrogen leaks resulted in congressional hearings and discussions regarding the decision to use the space shuttle to build the space station.

Following hydrogen leaks on the space shuttles Columbia and Atlantis and the Hubble Space Telescope mirror aberration problems, the United States Senate Subcommittee on Science, Technology, and Space held a hearing with NASA on July 10, 1990. Senator Al Gore opened the hearing by discussing quality problems at NASA. After some responses from NASA regarding quality testing on the Hubble Space Telescope, Senator Gore discussed the number of space shuttle flights that would be necessary to build the space station and begin discussing how NASA "shoots the messenger." Senator Gore talked about the corporate culture in the private sector and mind-set at NASA that was missing to the point where NASA would shoot the messenger stating there was a problem.

What followed was a missed opportunity by Mr. Thompson of NASA and Senator Al Gore or anyone else listening to lead NASA in a new direction. Mr. Thompson slipped up and stated for the record that "We are going to lose another one." What followed was a discussion of if NASA would lose a space shuttle during the building

of the space station. Mr. Gore and Mr. Thompson had entered a politically sensitive and dangerous topic to discuss, and finally, Mr. Thompson of NASA assured Senator Gore that NASA was sure a loss of the space shuttle would not occur during the building of the space station. Mr. Thompson stated that the worst he foresaw was possibly an in-flight abort.

Senator Gore and Mr. Thompson of NASA and every other NASA manager and Washington, DC, politician had a chance to lead and to change the plan, a plan that was already unnecessarily similar to Operation Market Garden in World War II. The Operation Market Garden goal to cut off German troops ended when the Dutch prince Bernhard could not help himself and just had to announce over the radio that Eisenhower was about to liberate the Netherlands. Following the radio announcement, most of the German troops did not wait around to see the invasion and evacuated. The German armored divisions evacuated to Arnhem, which was where the final bridge and objective of Operation Market Garden was situated. The German armored divisions relocating to Arnhem was a worst-case scenario for Operation Market Garden.

Operation Market Garden, A Bridge Too Far

"Sir, I think we might be going a bridge too far."
—Lieutenant General Frederick Browning
at the final conference before Operation
Market Garden at Montgomery's headquarters

There is both a movie and a book about Operation Market Garden, both named *A Bridge Too Far*. If you watch the movie, try to count how many big movie stars you recognize. The movie does a good job revealing some of the blunders and mistakes both the Allies and Germans made in the battle. The movie is good, but the book reveals how deadly and how perilous the battle became for the thousands of Allied paratroopers.

I think President Reagan and NASA building a space station before having a better foundation for success and a vehicle to replace the space shuttle to get to and from space has much in common with Operation Market Garden. There are many times when individuals and corporations and governments and bureaucracies plan and attempt something beyond their capability or reach and end up in trouble.

A I read and reread and think over Operation Market Garden, I get the feeling the Allies had a tremendous number of paratroopers looking for some action in the war and looking to be of use. But just because there is a tool in the handbag does not mean it needs to be

used. Every English unit socket set has an 11/16 socket. I have used many an English-system socket, but I have never had to use an 11/16 socket. Also it seems the British General Montgomery was looking for a way to end the war quickly and, by doing so, becoming famous.

One problem was Montgomery and Eisenhower were so out of touch with the front line war that they missed an opportunity to cut off many German forces on the coastline just before Operation Market Garden began as the Allied troops had advanced farther than expected prior to Operation Market Garden.

Eisenhower's Unintentional Bluff

The other problem was what I will call the Eisenhower bluff. The politicians in Belgium were so anxious to return to power and to get their kingdom back that they got General Eisenhower to make a radio message stating the invasion of Belgium was about to begin. Eisenhower's unintentional bluff was so powerful it created a chaos retreat of the Germans along the coastline known as Mad Tuesday, which actually lasted for several days. There were no longer any Germans to cut off. The Germans folded to Eisenhower's bluff and left the poker table.

When you play poker, if a player lies and uses propaganda like the Nazis and Japanese did, you don't know if you can believe them. But since Eisenhower was not much of a bluffer, when Eisenhower announced the invasion of Belgium was imminent, the coastal German forces panicked and retreated. Operation Market Garden not only no longer served any purpose but also, by the time Operation Market Garden finally began, the German tank divisions had retreated and regrouped right at the seventh bridge that was thought to be critical to capture to bring forth Allied success. The result was a very bloody and costly and unnecessary battle of World War II that matched Allied paratroopers against Nazi tanks. The Las Vegas odds for paratroopers versus tanks are not normally very good.

In hindsight, which can be 20/20, I offer the following alternative to Operation Market Garden, which gives the seventy thousand or thereabouts paratroopers a change to end the war early and get some action while minimizing casualties and contact with the enemy. I will call this Operation Wreak Havoc.

Operation Wreak Havoc

In Operation Wreak Havoc, instead of Operation Market Garden, Allied paratroopers are dropped into Germany at strategic points that maximize the ability to destroy German supply lines, communications lines, factories, and transportation while also maximizing the ability to use heavily wooded areas and similar routes to return to the battle lines after wreaking havoc. Perhaps there would be three major disruption areas. By the time the Germans react and send troops to retaliate and to control the situation, most Allied troops would be gone, retreating toward the battlefront in preparation to be resupplied to battle the German front on two sides of the battle line. A few troops would remain to continue to wreak havoc in other locations to keep the enemy confused as most troops would be avoiding heavy enemy contact and heading toward the battle line, perhaps reassembling in three locations.

Try to imagine the reaction of the German commanders in Belgium and Holland, hearing Germany is being invaded and torn apart while they are still on the western front. I think this could have caused considerable confusion and disruption and panic and retreat by German soldiers back to Germany, clearing the Germans out of Belgium and Holland and allowing an earlier end to World War II. I think I'd tell the Wreak Havoc soldiers to give the German women a kiss on the cheek. What would the German soldiers on the front line think when they hear their women back in Germany are being kissed by the Allied soldiers? I think the German soldiers would be ready to go home.

Ronald Reagan would manage (not lead) the nation a bridge too far when he announced NASA would build a space station. Before that space station was completed, the only American vehicle capable of taking Americans to and from that space station proved itself to be in need of replacement, and a business interruption occurred once again in American human spaceflight.

Similar to Operation Market Garden, which went a bridge too far for no reason at all by the time the plan was implemented, NASA got about halfway through building the space station when the Columbia disaster occurred. General Bernard Montgomery Disease, also known as *A Bridge Too Far* Syndrome, was clearly evident in the Oval Office, in Congress, and in the NASA-IMS when doubts arose regarding NASA's plan to use the space shuttle to build and to service a multinational space station.

This Senate subcommittee hearing and period of time when two orbiters were leaking was a missed opportunity to lead and to change the course of NASA human spaceflight, to review NASA's purpose, and to lay out a new vision for NASA.

July 22, 1993
My First Letter to President Bill Clinton

On July 22, 1993, I wrote my first letter to President Bill Clinton regarding NASA. I wrote the president regarding several topics. Regarding NASA in particular, this is what I wrote to the president:

> Regarding the space program, do me a favor: Ask Dan Goldin the next time you see him this question: If we lose another space shuttle and everyone on board, will another space shuttle ever fly? I work for NASA. All this attention regarding the space station is good, & costs and mgmt. needed to be set, but yet I don't see a vision for NASA that comes from desire, but instead one of reaction to current events. NASA needs a new vision. I think that vision should be to make transport from earth to space easy. That's the vision. Spaceflight should become ordinary, not even in the news, cheap, no hoopla. NASA needs to focus on spaceflight.

September 9, 1995
My Second Letter to President Bill Clinton

On September 9, 1995, I wrote another letter to President Bill Clinton. I wrote my letter following what was known as the Garcia letter that was sent by Jose Garcia to the president. Mr. Garcia's letter discussed increasing the space shuttle reliability, but even with the increase, Mr. Garcia discussed there would still be a space shuttle loss. I told President Clinton he should ask NASA what NASA plans to do if NASA was in the middle of the space station construction and another space shuttle was lost.

To my surprise, I received a response to my letter from J. Wayne Littles, associate administrator for spaceflight of NASA. He stated he was responding concerning the safety of the space shuttle, which was not my concern. I knew the space shuttle was not safe. My concern was what would happen if we were halfway through building the space station and we lost another space shuttle. Mr. Littles assured me that "NASA is aggressively pursuing any and all mechanisms for ensuring crew safety in the planned restructuring of our current system and in the development of future systems." But as I have stated, when I was working on the orbital space plane future system, there was no planned provision for a launch escape system.

I wrote back to NASA administrator J. Wayne Littles, and I told him the main reason I was writing him was to share my vision for human spaceflight. I told him that to build cheaper, we must completely eliminate preflight review. Preflight review is a form of

inspection, and the attempt to inspect quality into a product instead of designing the quality into the product to begin with. We, NASA, spent billions of dollars on preflight review.

I wrote the following to NASA associate administrator J. Wayne Littles on January 18, 1996:

> We need to design a vehicle in which the crew has a high certainty of survival regardless of catastrophe. I liken this to building a better barrel to go over Niagara Falls: regardless of your other objectives, your prime objective must be to have the barrel rider survive! Crew survival is the key to design with a Niagara Falls barrel or with a manned vehicle. Build a crew compartment that survives nearly any catastrophe and then attach it to a big dumb rocket [big dumb rocket discussions were a hot topic at this time] or something similar. Then you have safe, and you also have cheap.
>
> In Quality I have learned much thanks to training and work NASA has given to me. I know a bad statistic when I see one. At the Space Exploration Conference '94 in Houston, Texas, Rockwall Aerospace said the Space Shuttle "has the highest launch success rate of any existing launch vehicle—98.5%." Although true, it is a terrible statistic to market upon; it is based on one catastrophic data point, not several, and there will most likely never be several data points: one more catastrophic data point could well be the last data point for the Shuttle, which brings me back to my first point regarding the long-term vision of NASA.
>
> No well-established business likes to operate knowing the next sale or next move may make or break the business. Not many conserva-

> tive investors put all of their investment eggs in one basket. Yet with NASA it seems we operate flight to flight with the Shuttle. Can you imagine being in the middle of Space Station Operations and then having the next Shuttle Catastrophe? I guess older NASA employees could retire, but what about us youngsters?
>
> There are the problems of today and the problems of tomorrow. Of the two problems it is the problems of tomorrow that deserve top managements immediate attention. I think the time is now to design, build, and operate the next manned vehicle, and to really make it everything we really want to make it be.

I mailed that letter to J. Wayne Littles, and that was our last correspondence.

November 2001
TRIP Technology

During the year 2001, I developed a concept I called TRIP technology. We loved acronyms at NASA, and we wanted to go places at NASA; so I thought TRIP would be a good acronym. I was going to simply use DRIP technology and refer to Apollo 13, but DRIP sounded like something that comes from a coffee machine or a leak. DRIP stood for "Double Redundant Independent Protection." But drips and leaks are no good in the rocket business. "Triple Redundant Independent Protection" or TRIP technology sounded much better. And why not TRIP for most failure modes? Why not have three independent systems to protect from loss of life at all or most all stages of travel? This goes beyond risk management into attempting to manage and deal with uncertainty. Automobiles already had TRIP for some failure modes. If an automobile had airbag systems, seat belt systems, and automatic braking systems for some failure modes, automobiles already had three independent redundant safety systems.

I think TRIP technology is the design approach of the future fifty years from now. Safety, survival, rescue, and sustainability will be the design basis for everything. Design first philosophically for extreme safety and extreme uncertainty and then add destination, efficiency, cost control, and all other aspects to achieve practical designs.

I gave several presentations and examples. In November of 2001, a reviewer from another advanced technology division told me I was not really proposing technology but instead a change in the entire design and operations philosophy for human spaceflight. I think I was actually proposing both.

I sent a patent application to the NASA patent department for a space-capsule double-escape system. Basically, the Apollo crew LES would also have independent single-crew member Gemini-style ejection pods also. If one system did not work, the other system would be available. For some failure modes, one system would be preferred over the other. This is not much different from an automobile having both seat belts and airbags. The patent office told me my design had no commercial applications, so they declined to further my invention.

I was working part-time in the advanced technology branch at the time, developing TRIP technology. At that time, nanotechnology was a hot topic, and our branch chief was using a lot of resources on nanotechnology. I told the branch chief that the technology of safety in design and test and survival technology and systems were more important than studying nanotechnology and that survival and safety systems and technology could make the biggest impact upon allowing NASA to change the way NASA does business.

Some of the approach I used was just extreme safety and survival in design. Instead of designing a car or bus or rocket to certain requirements and then adding safety and survival requirements, use the opposite approach: have the survival and safety requirements and then make all other requirements secondary.

There are some vehicles in the world today that focus more on safety and/or cargo assurance more than on gas mileage and other efficiencies. Examples include the president's limousine, armored money transport vehicles, and various battlefield troop and cargo transport vehicles. Also included is a redneck's biggest engine possible truck with a cattle guard on the front end. With a cattle guard, the redneck may actually take more risk than normal, but while the risk of a redneck driving this truck may be higher than average, the cattle guard acts to lower uncertainty. The redneck accepts the risk of

a head-on collision but feels certain the cattle guard will act to win the collision.

Here is an example: You are going to design a school bus with unlimited spending available. All you have to do with this school bus is to transport one child one mile to school. Think of the possibilities. There could be multiple escape doors. Body armor. The best metallic and nonmetallic materials and nonflammable materials. Survival gear and systems. Rescue systems. An escape vehicle. Floatation systems. At times I would use a similar approach for rocket designs and try to have three independent protection systems at all times. But we were so far away from safety systems at NASA and so ingrained into the space shuttle right-stuff NASA-IMS culture that it was no surprise to me that no consideration was given to put safety first and foremost—to have a launch escape system for the orbital space plane.

We, NASA, had gone a bridge too far, similar to Operation Market Garden in World War II. We, NASA, were proposing to build the X-38 to return astronauts from the space station to earth in case of a space station emergency; but the truth was that we, NASA, could not even get astronauts safely to low earth orbit and to the multinational space station. Following the Columbia disaster, America would now have to rely upon our friend Crazy Ivan and his rocket that had a launch escape system to get astronauts and cosmonauts to and from the multinational space station.

The day after the Columbia disaster, I gave a simple handwritten note to the Johnson Space Center (JSC) center director and wrote him that he might as well throw the X-38 into the garbage dumpster now. I knew the X-38 program would be canceled now that it was clear the space shuttle was a failure. I knew the OSP or whatever was to follow would likely have a launch escape system. It took a Titanic disaster to get lifeboats on passenger ships. I was pretty sure the Columbia disaster would finally make launch escape systems standard on future spacecraft. Amazingly, I was sure the NASA-IMS was still not old enough to understand why rockets needed to have launch escape systems when the Columbia disaster occurred.

Missed Leadership Opportunity No. 7
The Failure to Lead Given the Opportunity Following the Columbia Disaster

On February 1, 2003, the space shuttle Columbia disintegrated during atmospheric entry, killing all seven crew members. The were some discussions after the disaster as to whether or not an Apollo 13-type rescue would have been possible. Since the NASA-IMS did not understand the lessons learned from Apollo 13, such discussions were beyond the NASA-IMS comprehension and, therefore, just babbling. If this seems unimaginable, just imagine two infants in strollers next to each other observing a car accident. Try to imagine the two infants turning toward each other to have an intellectual accident analysis and lessons-learned discussion of the car accident they just observed. The infants are simply too young to comprehend what just happened, and so it was for NASA regarding learning anything from Apollo 13.

At the Challenger memorial service held at NASA JSC, some of the JSC employees were able to get up pretty close to President Reagan. It seemed every NASA employee that had a part-time job as a peace officer was in their police uniform that day with a gun in the holster. Ronald Reagan arrived with three black limousines. We were not screened for weapons. All that would change for the Columbia memorial. At the Columbia memorial, everyone was screened for weapons. George W. Bush arrived with eleven or twelve black limousines, and we were all fenced off.

At the Columbia memorial service held at NASA JSC, George W. Bush described the pilot as having the right stuff. The pilot did have the right last name. McCool is a pretty cool last name for a pilot. He described the mission scientists as dedicated professionals. The president, the Congress, and the NASA-IMS all wanted to believe NASA was in both the right-stuff era and a "lots of stuff" era, but it was all make-believe; and I, for one, was not believing what I was hearing. NASA could not have it both ways. NASA could not be in both eras at the same time. The right-stuff era was over, and NASA was rocketing an experimental rocket with less safety systems in design and test than the Apollo rocket predecessor, a rocket that was not prepared to support a "lots of stuff" era. NASA was adrift in space, in no era at all to be remembered by.

Several months after the Columbia disaster, NASA administrator O'Keefe went before the House Science Committee several times. I watched some of those hearings. At one of those House Science Committee hearings, Chairman Sherwood "Sherry" Boehlert asked NASA administrator O'Keefe if he had a plan for NASA's future. This was a tremendous moment and opportunity for NASA, an opportunity for NASA to stand up upon its own two feet, to perhaps take baby steps for the first time. NASA could lay out the plan and strategy to go to the moon and mars at constant or slightly declining budget and the plan and strategy to deal with astronaut bone loss in space and other milestones needing to be addressed for the first time in any strategic plan. But NASA administrator O'Keefe's answer was simply, "I cannot take my eyes off Columbia."

Once again, NASA did nothing. The NASA-IMS remained virtually unchanged. Some representative then said, "Someone go contact the president's science advisor." Once again, the NASA-IMF and Congress failed to lead NASA and left the task of what to do with NASA dumped into the Oval Office.

When President Obama's advisors proposed a human mission to an asteroid, anyone who was anyone at NASA knew the idea was just plain stupid. But again, it seemed everyone at NASA did little to stop stupid.

My Official Political Assignment at NASA Working Inside the Roads and Commodes Box

The Monday morning after the Columbia disaster when I returned to work, one of my two essay reviewers told me I was going to be famous, writing an essay warning about killing astronauts the day before seven astronauts were killed. But NASA had other plans for me. Two months following the Columbia disaster, I was assigned from the OSP and advanced spaceflight to institutional safety. In other words, I was transferred from advanced spacecraft design to what we at NASA called Roads and Commodes.

Once put in my Roads and Commodes box to work, I decided to go ask the NASA safety director why I was reassigned. The simple answer was "It was political." I thought about that answer for a couple of weeks and decided that if I now had a political assignment, I needed to write letters to politicians to advise the politicians about NASA. This was, after all, the basis of my new job assignment.

At first, my letters were no good—simply way too long with too much useless information and reference information. Soon I learned to target my letters to the House Science Committee and my two Senators in Texas. I also observed committee and subcommittee hearings. I was lucky to get even a form letter or two back at first. But I got better at my job with time. My letters got shorter and to a simple point or two. I began to notice Senator John Cornyn or one of his aides was

reading or at least scanning over my letters. I never got anything back from the White House. I stopped writing to the Oval Office—it was a wasted postage stamp when members of Congress were responsive.

The Emperor's New Seat Belt

I wrote a simple little story that had a moral to it titled "The Emperor's New Seat Belt." I mailed this letter to the House Science Committee. Congress Ralph Hall wrote me back a personal letter. This would be the start of several letters regularly sent back and forth between myself and Congressman Ralph Hall. I thought Joe Barton would be responsive since he had an engineering background, but Joe was never responsive and had other political problems.

The space shuttle Columbia had broken up on and around the congressional district. I could see why Ralph once stated he was bothered by the space shuttle Columbia's loss as much as anything that had ever bothered him. There's nothing like the sky raining down dead astronaut bodies upon your congressional district and into your constituents' yards to give you a nightmare to recall now and then.

This is the story of the emperor's new seat belt.

Once upon a time, there was a very young bureaucracy named NASA. One day, the emperor went to see a new large rocket being built by young NASA. "How do you like my rocket, Emperor?"

The emperor noticed NASA seemed very young and impulsive. "It's amazing!" The emperor looked up to the very top of the rocket. "What's that little rocket on top of the big rocket?"

"Oh, that is a launch escape system. Why, it is kind of like the seat belts that are now being put into newer cars. In fact, my new car has a seat belt."

"Are you expecting something to go wrong?"

"Oh, no. Of course not, Emperor. But rockets are dangerous, and we care about the astronauts. You know they are amazing. The astronauts are America's finest."

Several years later, the emperor returned. He noticed young NASA still seemed young and impulsive. "Congratulations, NASA, on your trips to the moon and back."

"Thanks, Emperor. I would say it was nothing, but aren't we amazing? I think I'm bulletproof! Like Superman! By the way, how do you like my new car, Emperor?"

"Wow, that's nice."

"Yes, Emperor, it now has a shoulder seat belt and lap seat belt and airbags. And the automakers are finally crash-dummy testing cars like we did with Apollo."

The Emperor was looking up at the new rocket. "Hmmm... where did the little rocket go, NASA? You know, the equivalent of the seat belt...is it there?"

"Emperor, this is a space shuttle. It's like an airplane. We are now flying into space. We are bulletproof."

"But isn't this a rocket?"

"Not really, Emperor...well, in a way, I guess."

"I thought rockets were dangerous?"

"Emperor, you know me, have I ever failed you? And besides, those astronauts are crazy anyway. They'll try anything."

But the Emperor was still looking for the little rocket he saw long ago on top of the big rocket. "I just don't see it, NASA."

"Don't worry, Emperor. It is safe, I promise you."

Years later, the emperor retuned to see NASA following a rocket explosion. "Hi, Emperor, would you like to take a ride in my new car? These new cars are just amazing, aren't they?"

The emperor noticed young NASA had hardly changed a bit. "You still look so young, NASA."

"Thanks, Emperor! So do you want to go for a ride in my new car? This car has had front-impact, side-impact, and rollover crash-dummy tests."

"First I'd like to look at your replacement rocket for the one that exploded." The emperor looked at the replacement rocket. "It looks just like the one that blew up."

"Yes, it is almost exactly the same."

The emperor looked up to the top of the rocket. "Where's the seat belt?"

"Emperor, it doesn't need the seat belt. It is already safe. We lost one, but that was just a glitch. We fixed the glitch. It is safe, Emperor, I promise you."

Years later, the emperor returned once again to see young NASA following another rocket disaster. The emperor noticed NASA still looked much the same and still moved impulsively. "I thought you promised me it was safe, NASA?" The emperor noticed young NASA once again had a new car.

"It's just one more glitch, Emperor, and we fixed it. And those astronauts, they are all nuts. They are true lunatics. Do you want to go for a ride in my new car, Emperor?"

But the emperor was still looking for the little rocket he saw long ago on top of the big rocket. "I just don't see it."

"It's there, Emperor, I promise you. Safety is built into this airplane. It's really just flying. It's not rocketing at all."

Young NASA wasn't sure the emperor had heard anything he was saying. The emperor was still looking up to the top of the rocket. "I just don't see it."

Work Inside the Roads and Commodes Box Giving Political Advice to Politicians

Representative Ralph Hall wrote me that he loved the story and stated that the young NASA was sure to have some growing pains to come. I wrote Ralph another letter with a vision for human spaceflight. I wrote Ralph that NASA was so far behind the automakers in passenger design, test, and safety that NASA should be sending some engineers to benchmark the automakers. About two months after that letter to Ralph, my safety director who reassigned me to roads and commodes came to our institutional safety division and announced that NASA was going to send a team of NASA engineers to benchmark the automakers. I said that was probably in response to a letter I had written to Congressman Ralph Hall. My director looked at me, and I was certain it was a look of extreme doubt that anything I could ever do would amount to anything ever happening at NASA, especially now that I was being kept quiet in a roads and commodes box.

With my NASA-appointed political assignment inside my roads and commodes box, my letters to various members of Congress were getting better. I studied and read and learned what each of the members of the House Science Committee valued and what their written opinions were. With the Indian Ocean tsunami destruction, the House Science Committee chairman Sherry Boehlert held hearings to assure the Pacific Ocean tsunami buoys and warning system was acceptable. I realized the Atlantic Ocean also needed to be addressed,

thus I wrote Chairman Boehlert a letter with Atlantic Ocean tsunami recommendations. I received a letter from Chairman Boehlert thanking me for my advice. I figured if I could write short, concise letters with good advice, the various members might look forward to my letters and advice in the future. I chastised a few two-faced members of Congress, but since all members of Congress are crooks, I refrained from writing letters about problems. Instead, I focused on offering solutions and good advice.

I knew Congressman Ralph Hall was going to become the chairman of the House Science Committee before too long. I know Ralph used some of my advice when he spoke up regarding the lack of safety requirements regarding the so-called commercial crew program in March of 2012. I had written Ralph a letter on February 9, 2012. By this time, my letters were now "customer focused."

In my February 9, 2012, letter to Ralph, not only did I lay out an engineering plan for a human mission to Mars at constant or declining budget but I also offered options. I gave Ralph the political foundation for success, describing how the plan was credible and dignified. I was sure Ralph did not want any more astronaut dead bodies falling from the sky onto his roof and onto the neighbors' yards for the dogs to fetch.

My letters were constantly improving and as simple as possible. As I laid out the long-term plan, I also briefly laid out the jobs programs and how large those programs would be and how long they would last and then be transformed to continue to last. I wrote how and when universities could be involved, the military interest, and needed export control. I knew the best way to assign the work to the space centers as well as how to keep the cost low. No longer would I simply give an engineering plan—from here on out I would give the political foundation for success, the engineering plan, the long-term continuous-improvement jobs programs that would emerge, and center assignments.

Ralph wrote back in a letter dated March 12, 2012 and stated the following:

Dear Paul,

> I have read - + re-read your good 2-9-12 letter. I thank you for it. I am very concerned with the direction NASA faces. When the President ran an ink pen across the word CONSTELLATION [like this, and Ralph demonstrated a line through CONSTELLATION] + canceled everything that both Democrats + Republicans had agreed on for several years—he set the program back + almost destroyed NASA - + our Space Station visits. Many jobs have been lost - + the future is very stormy for NASA. I am working to save our goals.
>
> —Ralph

I knew it was probably not the time for a new program and new approach to low earth orbit with the political hacking going on, but I wanted to give Ralph the engineering ammo and a plan on how to have a dignified approach and low-cost approach to conquering space. But it is tough to change job programs that have become deeply rooted into the FDR work program portfolio.

In 2009, President Obama appointed Charlie Bolden to be the NASA administrator. Sean O'Keefe was a bean counter or accountant trying to account for all the missing NASA overspending, as if our government cares about not overspending. Then came NASA administrator Michael Griffin to bring a scientist to the top of NASA. And now there was Charlie Bolden with a hatchet.

I watched NASA administrator Charlie Bolden testify before the House Science Committee. By now I had observed the House Science Committee hearings enough to realize why Obama had hired Charlie Bolden as Bolden pretty much just ignored the House Science Committee. Charlie Bolden was an Obama Republican scalper. Charlie's job was to hack and to chop the Tom "the Hammer" Delay crap out of the Republican state of Texas NASA Johnson Space Center budget and to send that money to the Democratic state of California.

The jobs lost in the two billion dollars taken from the Republican state of Texas by Obama and given to the Democratic state of California allowed me to retire early from NASA as the NASA JSC layoffs came. With the federal budgets growing into morbid bureaucratic obesity, I could not foresee any increase in federal wages over the next decade. With the early retirement opportunity during the Obama starvation of the Republican NASA JSC Texas, it was time to say goodbye to my comrades at NASA and leave my socialist political advisory box and head back toward capitalism. My political advisory position at NASA was ending, and I was not even petered out yet according to the Peter Principle. It was a good time to go.

Now we, the Americans, have two human rockets soon coming: the Musky-Obama SpaceX Democrat rocket and the traditional Eisenhower industrialized militarized complex mostly Republican states rocket. The Democrats now have their own rocket, and the Republicans have theirs. Thus along with Obama health care, we also have the Obama California adventure rocket.

I'm not so sure about that labeling and extreme simplification; but then again, I am now retired from NASA, so I no longer have a roads and commodes and political advisory position to fulfill at NASA. I'm finally free from my comrade box and all the comrade-oddity.

A Large Step for a Lady

So where do we go from here? I still have a vision of greatness for NASA. I see a large step for a lady on a red planet and a smaller, less arrogant step for humanity.

Advertisers should cover much, if not all, of the first human mission to Mars or return to Mars. We will see if NASA has imagined that. Which brand of toilet paper will be the first wiped on Mars? Which toothbrush? Whose toothpaste? Will it be Diet Pepsi or Diet Coke? Bud Light or Miller Lite or even Shanghai Spirit? The capitalism was certainly missing from the Apollo missions. Among the Mars craters, there should be plenty of billboards and banners placed by the first humans on Mars.

How do we get to Mars? Following the Challenger disaster, the Rogers Commission recommended NASA becoming a more developmental agency, and the Agency Advisory Safety Panel (ASAP) recommended separating the crew and cargo components regarding launches to low earth orbit, just as we have cars for people on earth and 18-wheeler trucks to transport cargo. A good start would be for NASA to finally implement those two Rogers Commission recommendations. Cost control and mass production will conquer space just as on earth.

I can easily envision the first four humans going to Mars. At least two would be medical doctors—general surgeons. Like RVs in space, the mini-stations could be connected in series to increase reliability and Apollo 13 redundancy would already be in place circling Mars and on Mars and ready for the return from Mars to assure a

high probability of success. The last step would just be getting the crew to Mars. Each astronaut would go down to Mars's surface and return back up to Mars's orbit one at a time. Why one at a time? The answers is always cost control and Ps, which stands for "probability of success." Someday, when NASA is old enough to understand the difference between success and failure, the NASA-IMS will evolve into a NASA-MS and understand Ps.

Additional Definitions

Success

If at first you don't succeed, try, try again...or benchmark or mimic the competition.

What is success? What does it mean to be successful? If a manager manages to get all the work done within the fifty-hour work week, not including the evening checking of e-mails and texts, the manager feels successful. A leader has to wonder why so many managers are working so many hours and attending so many meetings with all the communication tools available in this day and age. The leader further wonders why the organization is not highly successful if everyone is working so hard and keeps trying to figure out the reasons why.

The Dalai Lama had a recent comment about how so many men work so hard to make money and let their health suffer and then, later in life, use the money they made to pay for their poor health because they worked so hard and let their health go. Of course, the Dalai Lama has never been laid off or fired from work, wondering how he is going to feed his family. It is, after all, the religious hierarchy the Dalai Lama is a part of that lives the good life and invented champagne. I think the 40 percent of Americans who are not obese would have to agree with the Dalai Lama that health is one measure of success. I think over 50 percent of Americans will agree New Year's Eve can be even more of a success with champagne.

Being in good health requires self-control. For an individual, this means not overeating, eating the right foods, and exercising,

especially cardiovascular exercise. It is amazing that media has us worry about fatalities due to terrorists on the order of hundreds to thousands of deaths a year when heart disease kills tens of thousands of Americans every year. Perhaps for each minute of news time blasting terrorist sensationalism, there should be one hour devoted to preventing heart disease nonsensationalism.

For a nation to be in good health, one would think this includes controlling spending and controlling bureaucratic growth and stabilizing the population. Perhaps nobody cares anymore and we have just let the nation's waistline (or is that waste-line) go. I think the founding fathers of America, and now the mothers also, would agree that controlling government spending and controlling bureaucratic growth and freedom have something in common. More government and more spending equates to less freedom, whereas less government and less spending equates to more freedom. And of course, way too much government leads to no money to spend and no individual freedom, also known as North Korea.

The Wright brothers flew the first human-powered airplane but were very secretive and eventually had to take their invention to Europe to prove they flew first as they were getting left behind. The Wright brothers fought people in court for stealing their patents when they probably could have traveled the world and been invited to be on the board of directors for every aircraft manufacturer in the world. The Wright brothers succeeded in becoming two of the most famous people in the world, yet they fought the Curtiss aircraft company they would later merge with and did not put the small wing and rudder to the rear of the aircraft until late in the development game. One of the brothers died in a test flight. The Wright brothers were highly successful pioneers but not nearly as successful as they could have been as businessmen if they only had a business vision to go along with their creativity vision.

The Probability of Success

How many miles can you drive your car before you should change the timing belt? And if you do not change the timing belt and the timing belt breaks, will this failure damage your engine? I once had a mechanic convince me I should change the timing belt on one of my high-mileage vehicles, and so I did. About ten thousand miles later, the new timing belt broke! I think the mechanic made a mistake and probably overtightened the new belt, causing the new belt to break. Why do I mention this? Because if success alone is hard to define, try being even more intuitive and attempting to put probability numbers to the chance or odds of success. It is not easy. Insurance companies and casinos understand that success is a probable outcome.

Statisticians will try to give odds but will also have confidence limits for their odds. There is a slogan that goes "Liars, damn liars, and statisticians." Just before the second space shuttle disaster occurred, someone was estimating that the odds of a space shuttle loss were around 1 in 300. That person was a statistician, as the slogan goes. The odds of success depends upon how reliable and how good the data for success is. The more data, the more confidence the estimate can be reliable. I prefer to go with the large data in order to determine the probability of success.

Around the same time someone said the loss of a space shuttle was 1 in 300, I was thinking 1 in 50 to 1 in 100, which is about the average for all rockets with solid rockets being a bit more reliable than liquid rockets. Following the space shuttle loss, I would hope the person that thought the odds of a space shuttle loss were around 1

in 300 would lower their estimate. A man named Richard Feynman had some good things to say about how rocket reliability estimates depend on the bias of the estimator. By the way, my estimate was and still is the same before or after a space shuttle disaster as I estimate on the large data number of all rockets. Thus I still would have to guess that the rocket reliability of any human launch rocket is about 1 in 50 to 1 in 100.

Leadership

There are three types of leaders. There are good leaders, there are bad leaders, and there are those somewhere in between. Adolf Hitler is an example of a bad leader, although Nazi Party members of the 1930s might take exception to the bad category rating. Aragorn II is a fictional king character in *The Lord of the Rings* and basically portrays a good leader who does not abuse his power, although Sauron's army would probably disagree with the good category rating. Perspective is important as one tribe's view of a terrorist may be another tribe's view of a freedom fighter. One person's or tribe's failure could be another person's or tribe's success.

Good or bad leader or somewhere in between, any leader can be extremely dangerous without a good strategic plan. Leaders are dangerous because they are not afraid to changes things up and try something different. Without a good plan, a leader can lead themselves, an organization, or an entire nation into danger and peril. Managers are dangerous because a manager will fear changing things and trying something different and not change when change is needed. By not promoting change, a manager can manage to get themselves, their organization, or an entire nation into danger and peril. In large organizations, there needs to be a balance between leadership and management. The leadership does not have to be on top, but it needs to have a voice and ability to sway the vast management horde when change is needed.

Vision

It would be unfair to say that managers do not have vision. Managers do have vision. In general, managers have uncorrectable on their accordingly nearsighted vision. Managers are also known to have tunnel vision. The typical manager's tunnel is so long the typical manager cannot see the light end of the tunnel indicating the path to take. Managers fear the dark. Managers carry a flashlight and seem to point the way, but only because they fear the dark and because the tunnel gives them direction. The manager seems to be brilliant and enlightened and able to lead and see the way, but the manager lives in fear; and so the manager always has a small flashlight to help in the nearsighted daily meeting rituals and travels from conference room to conference room and PowerPoint presentation to PowerPoint presentation. In the military, the generals who pretend to lead but really can only manage as well as a lieutenant or corporal at best suffer from military management corporal tunnel vision.

Can we predict the future? People predict the future all the time. Weather forecasters attempt to predict the path of a hurricane or potential tornados. This is based on computer models and information and data collected over the years. I can predict that the world's human population will likely reach a maximum, and I am thinking this will occur around the middle of the twenty-first century. This is not so hard to predict. If exponential human population growth continues without end, within a couple of thousand years, the entire mass of the universe will have to be converted into human beings. That is, of course, impossible. Thus, with high confidence, I can

predict the human population will reach a maximum at some point in time, and I will guess the year 2050. There. I just predicted the future. But can I predict more based upon the past?

What else can we predict about the decade when the human population levels off? Let me try to go a step further. I will predict that around the middle of the twenty-first century, when the human population levels off, a worldwide renaissance will occur. There will be a great enlightenment and period of opportunity for individuals worldwide. How can I make such a prediction? Because this is what happened the last time the world's human population leveled off and actually declined for a brief period of years. The Black Death of the mid-fourteenth century was followed by the Renaissance in Europe. About one out of every three Europeans died from the Black Death in the 1400s. Was there a cause and effect? Imagine if you live in a city with horrible traffic and congestion, and suddenly, the next day one-third of the traffic is gone. Death toll aside, would that not enlighten your drive to work and back to not have any heavy traffic?

What will the upcoming enlightenment be like? Again, I look to the past Renaissance to predict the future. During the Renaissance, there was burst of individual human creativity. I think education will change in the future. Already, the traditional elementary-school, middle-school, high-school, and college-level teaching and learning is obsolete in many respects. The upcoming Renaissance will end the nonsense. We do not live in a *Fahrenheit 451* world, other than North Korea and a few other places. Fortunately, usually bad restaurants go out of business. People do not want to go to that restaurant to eat or to do business. We do not need to memorize books and pages of formulas, lest they become forgotten. There is not much need for the closed-book test in this day and age. People do not operate that way in the actual world.

The world forgot how to make the concrete the Romans learned how to make, but the Romans did not know how to reinforce concrete. The Roman Empire did not quite break though and figure out how to use and apply science as a tool. We are now managers and users of vast amounts of instant information. Basic principles are good to understand. Otherwise, adults working jobs use every tool

available to work and to innovate. English and effective communication will always be important. You can look like a real dumbass if you cannot talk and communicate in the information day and age.

Ethics may become as basic a course as language and mathematics in the future. Will humans get even more obese, or will they look more and more like slim and trim *Star Trek* characters? I think the obesity will "gain" at least until the next Renaissance. The age-old problem of bad people and bad managers will be a huge problem in the upcoming second Renaissance because horrible organizations and nations with bad management may seem to be tolerable with all the advancement worldwide. Sound crazy, my vision of the future? Probably is. How about you try to predict the future, and please give a basis.

Management

I used to work in a bureaucratic organization. I thought about becoming a manager, but I noticed something about the workers who became managers and were no longer just workers. These new managers, who were supposed to lead and motivate people, usually gained twenty to forty pounds of weight within three months. This scared the hell out of me. Also, these new managers did not change things. Things changed them. The managers, new and old, went to a lot of meetings and sat in meetings for many hours each day. The managers were usually the first to open a malicious e-mail because managers are usually very social and want to know everything going on. Heaven forbid some other manager know someone in their section has found out something about one of their employees before the direct manager. Can't they manage their people? Managers hate this type of embarrassment that a leader could care less about.

There are several ways to classify managers. There are good managers and bad managers. There are managers that can delegate, and managers that cannot delegate. The managers that cannot delegate are either micromanagers, or they do not manage at all and attempt to do everything of importance themselves. The managers that cannot delegate at all are not managers of anyone except themselves.

The management overreaction to failure and attempt to immediately fix the undefined problem and demonstrate their leadership that does not exist is commonly known as a "knee-jerk reaction." Thus following the space shuttle Columbia loss when NASA administrator Sean O'Keefe said he would create a center with three hun-

dred engineers to work space shuttle safety, he was having a knee-jerk reaction. His knee eventually settled back into place, and nothing much happened; the knee simply settled back in place.

Failure

There are two types of failures. There are good failures and there are bad failures. Most failures are usually considered to be bad, and some are very bad. There are also successful failures and failed successes. An engineering test that purposely fails a material to determine the material properties is a good and intentional failure. Humans are very clever; and regardless of whether an engineering, individual, organizational, or political failure, often the failure is predictable. When lessons are learned and appropriately applied from a failure, recurrence can be prevented. When lessons are not learned or learned in general but not applied as needed, history can repeat itself time and time again.

If some kids put a board across a ditch to cross the ditch, they may be able to cross the ditch. Then two kids may get on the board and notice the board sags more. Then the kids bounce and play on the board. With time, they may notice the board sags more than it used to, or they hear the board crack once or a few times. Suddenly, one day when two kids are bouncing on the board while crossing, the board breaks and the kids fall into the ditch. Is anyone really surprised the board broke? Did anyone think Galloping Gertie would last forever? Being human and being clever, maybe one of them later in life as an adult would think twice before crossing Galloping Gertie on a windy day.

The week and days before the Iranian hostages were taken, events were occurring that a leader would have grasped and sensed the need to prepare. Likewise, the US military received intelligence

reports that the Beirut barracks or other US military target was likely to occur. Leaders prepare for the future. Managers react to what has *just passed.*

Rockets fail on the average once or twice out of one hundred launches. The space shuttle was more scrutinized and inspected than the average rocket but was more complex than the average rocket. This averages out, by the law of averages, to make the space shuttle another average rocket that should fail once or twice out of every one hundred launch attempts. Thus it was simply the law of averages and highly probable, if not inevitable, that a space shuttle launch failure would occur. With only managers present and no leader to incorporate lessons learned from Apollo 13, there were only managers and no leader to understand just how both intolerable and catastrophic a rocket launch failure would be.

Failure types need to be defined and understood in order to assure success. In a redundant system, a catastrophic failure can occur to one system, making that system useless. If that is the only system, then the failure is also not tolerable. However, if there is a redundant system, the failure may be tolerable as the redundant system may still function perfectly well. Bridges are now designed with lessons learned to avoid the loss of one cable or beam causing a catastrophic failure.

Additional Case Studies

Introducing the Success Equation
Leadership "Times" Vision Equals Success

I'm an engineer. Engineers like to use equations to figure things out. I invented the Success Equation, which is leadership times vision equals success or L×V=S.

I use the Success Equation sometimes to analyze leadership, management, vision, strategic planning, success, the probability of success, and failure. I hope the reader will find the Success Equation useful in analyzing these ideals and principles and to see how these ideals interrelate in the reader's quest to be successful.

The simple formula is leadership times vision equals success. The formula is not additive; it is a multiplier. Both elements must be present to assure success, other than just getting lucky. An early example of the success story is the biblical story of Joseph and the Pharaoh, as follows.

Joseph and the Pharaoh—a Success Equation Introductory Example

From the perspective of the Success Equation, "The Story of Joseph" is the often-used but not-correct title. The correct title is "The Story of Joseph and the Pharaoh." It matters not if the Pharaoh's name is first or if Joseph's name is first. There would be no story about Joseph without the pharaoh, and there would be no story about the pharaoh if not for Joseph. This is the story about two men—one a visionary and one a leader—who combine forces to achieve success.

"The Story of Joseph and the Pharaoh" is one of the oldest examples of how leadership and vision combine to achieve success. The story is in the first book of the Bible, Genesis 41:1–57. Joseph was a visionary from the start. In his youth, he could foresee the future. His brothers did not like his vision for the future and managed the situation as managers usually do by throwing Joseph into a pit. Merchants rescued and took Joseph from the pit and sold Joseph to Potiphar, one of the pharaoh's government managers.

As a visionary, Joseph served Potiphar well, but Joseph had a problem. Joseph was nice-looking, and Potiphar's wife wanted to have relations with Joseph. When Joseph refused, she framed Joseph; and Joseph is sent to prison as Potiphar manages the situation like a good manager.

In prison, Joseph once again does well. With his visionary skills, he helps organize the prison. He meets the pharaoh's chief butler who had been thrown in jail. After hearing the butler's story, Joseph can

foresee the future and tells the butler he will be restored to his position in the pharaoh's palace.

If the story ended here, there would be no biblical story of Joseph. Joseph would have only achieved some mediocre position of a slave helping to run and manage a prison, like a 2000 BC *Shawshank Redemption* before the redemption. Fortunately for Joseph, there was a patient leader who lacked planning skills.

The pharaoh dreamed of seven fat cows followed by seven skinny cows and then the skinny cows ate the fat cows. Nobody could interpret the pharaoh's dream. The pharaoh's butler recalled Joseph and told the Pharaoh he knew someone who could interpret his dream.

Joseph went before the pharaoh and interpreted the dream. Joseph stated the dream was about the future. Seven plentiful years of feast would be followed by seven years of famine. Joseph described how to prepare for the future. The pharaoh liked the plan and put Joseph in charge of implementing the plan. Together, Joseph (the visionary) and the pharaoh (the leader) achieved success for Egypt.

We never really knew if Joseph had leadership skills. Perhaps Joseph was a rare individual with both leadership and visionary skills. All we know for sure is that Joseph was a good manager when put in charge and definitely a visionary.

I wish there was more detail regarding how long the pharaoh had been dreaming of the cows, as it seems the pharaoh was a patient leader and waited for the correct plan to accept to implement in order to prepare for the future. Leaders can be dangerous, which is one reason why the United States Constitution has an impeachment process.

In this book, I discuss the similarities and differences of managers and leaders. Leaders can be dangerous, ready to change things, and leaders may implement a bad plan for the future. On the other hand, managers can be just as dangerous as they may not want to implement change when a brilliant plan to prepare for the future is right in front of them. Thus when Bill Gates approached IBM and laid out a Microsoft vision for the future, there were only managers

resistant to change; and no leader at IBM was prepared to accept the proposed change.

Charles Darwin stated that it is not the most intelligent species that survive and not the strongest but those that can adapt to change. We live in a world of change. Most times things seem steady and the vast management horde that manages the world seems to perform adequately. But leaders can make change happen and react to change. According to the Success Equation, if S=0, it does not matter what type of leadership or vision is present because if you or your organization is not success oriented, you will only succeed by chance and not by plan and strategy.

Thus we can always ask the questions, What does it mean to be successful? What does it take to be successful?

When There Is No Leadership Jimmy Carter and the Failed Iranian Hostage Rescue Attempt

One more helicopter. Just one more helicopter, and the Iranian hostage rescue attempt might have been a success instead of a failure. What was the probability of mission success? Why did the mission have to be aborted? It appears to me that the helicopters and transport planes were not properly tested in similar desert conditions and at night with no radio contact to assure a probability of success. And what was plan B? And why did plan B not go into effect? If this mission was critical, why were there not adequate resources and redundancy and backup in case of a failure point along the way? But none of that really matters when there is no political leadership.

Was there no better plan? Could soldiers have been smuggled into Iran in a transformed oil tanker that would be a disguised troop carrier? Or a bus with a fake soccer team? Millions of illegal aliens enter the United States, so is it really that hard to enter Iran? Why not put Iranian flags and insignia and markings on the American helicopters and simply fly right in?

I think Jimmy Carter was a good and peaceful man. He tried hard to bring peace in Israel and Egypt. He admitted he had a lust in his heart or, in other words, a natural attraction to the opposite sex, if you can imagine that. At what point does Jimmy Carter cross the line from peaceful good person in the Oval Office to a wimp with no guts at all?

The cowardly lion in *The Wizard of Oz* could at least pretend he had some courage. As I studied Jimmy Carter, it seems it took him a long time to make decisions. I guess he put a lot of "good peaceful person" thought into who he would appoint to be his cabinet members, but his term was half over by the time he made some of his decisions. The problem was, he was not a benevolent dictator with thirty or forty years to make decisions. He did not get the Iranian hostages out of Iran until Ronald Reagan's inauguration day. I imagine that if Jimmy Carter had been a benevolent dictator for life, the Iranian hostages might still be in Iran today.

The Democratic Party wanted to get a clean nominee following Dirty Dick Richard Nixon and the Watergate scandal. But good people do not necessarily make good leaders or even good managers. The new Iranian regime fed off the crisis and the Carter management reaction to the crisis and used the crisis to increase their power grip. I think if Jimmy Carter had been a leader, he simply would have told the new Iranian regime that he would go to Iran exactly one week after the crisis started with Air Force One and with another transport plane to bring home the hostages in. That simple. Leadership stepping forward. Of course, he could fly in on the transport plane a few minutes after Air Force One landed if intelligence reports predicted the worst with the Marines and Air Force flying and refueled in the air at or near or a few hundred miles inside the border ready to come in. He would briefly meet with the Iranian regime and hear their concerns and then bring the Americans home. Crisis over without a bullet fired. If the Iranians refuse, then they have made the choice to not make peace. You simply force them to show their hand by calling their bluff. What other option do the Iranians have? They can't draw any more cards. They have already shown their hand.

I guess Jimmy Carter was too good of a man to ever play poker. Otherwise, he would have known to call the Iranian bluff. What were they going to do? Jimmy Carter held the stronger winning hand. No matter what the Ayatollah did, no matter how high the Iranians seemed to raise the stakes, your pile of chips is higher and you call their bluff. You just fly in and make them either be civilized, or you end the game with your guns pulled and firing.

Too fast for a wimp to consider going right in and getting your people without a fight? Well, there were other strategic mistakes the Iranians made along the way that a leader would have capitalized on. One was the Iranians stating the American hostages were their guests. I think a leader would have fully exploited that statement and sent the press to Iran to pressure and to verify the Tehran Hilton was not like the Hanoi Hilton of the Vietnam War. The Iranian government stated their actions were nonviolent and gentle with respectful treatment to demonstrate the dignity of Iran. Iran said the Americans were being treated like guests. Why, then, are the guests being blindfolded and beaten and isolated? Why not beat the Iranians with their own words?

In the end, Jimmy Carter paid $7.977 billion dollars in gold to release the fifty-two American hostages. That is quite a ransom; it comes out to 153 million dollars per hostage. I wish every American was worth 153 million dollars. Imagine if some nation took fifty-two Americans hostage today. Currently with a national debt of around 18 billion dollars and around 320 million Americans, each American today is worth a negative $160,000. Americans are worse than worthless; they are each worth a negative $160,000. If some nation today took fifty-two Americans hostage, the president would have to get the treasury department to give that nation a call and demand ransom and tell them, "Listen if you are going to keep those Americans, we are going to need you to pay the United States eight million dollars. Those Americans owe us a lot of money, and they need to pay their debt before you can take them."

No wonder no state can even consider succeeding from the Union in this day and age—the buyout would cost a fortune. For the same reason, no wonder no more states are being added to the Union—who would want to debt in? I'm not sure if all the illegal aliens crossing the border today really know what they are getting into. No wonder we only pretend to stop the illegal immigration. We create a new potential 160,000 debtors with each crossing.

When There Is No Strategic Plan Ronald Reagan and the Beirut Marine Barracks Failure

Leaders are dangerous when they step forward without a good strategic plan. On October 23, 1983, a suicide truck bomber drove through a fence and a barricade, bombing a building and killing 241 American servicemen. Within ten minutes, a similar suicide truck bombed and killed fifty-eight French paratroopers. It is all too easy to agree with the investigation conclusions that the barracks barricade and protection was not sufficient. I want to apply the Success Equation to this failure in history to analyze why this failure occurred and what could have been done differently to succeed.

Leaders can be dangerous, especially when they do not have a plan and when they are not completely sure how to be successful. In the story of Joseph and the pharaoh, it seems the pharaoh was quite patient as he waited for the proper interpretation of his dream and a long-term plan to assure success. In the case of Ronald Reagan, we see an individual who is not afraid to lead and to make a change. I am going to assign a leadership L term of 1 for this case and conclude the failure was not due to the top-level leadership. The failure appears to be due to either a bad plan or simply not knowing what was needed to be successful in Lebanon.

President Reagan's cabinet appeared to be in disagreement regarding what to be doing in Lebanon. Perhaps the main problem was that success in Lebanon was never clearly defined. What was

the strategic goal? Why was the military presence needed? But let us assume the president and his cabinet members knew what they were doing (this is usually a very bad assumption regarding any president and any situation), and let us assume the president and his advisors knew how to achieve strategic military and political success in Lebanon. Let us make the bold assumption that the politicians knew what they were doing and getting into. In this case, L=1 and S potentially can equal 1. Let us, therefore, look for fault within the military plan to have a military presence in Beirut. What was the value for V?

As I analyze the situation, my first observation is that the Beirut, Lebanon, Marine barracks was really not a barracks at all. It was a large building with a first-level parking lot that a suicide bomber or vehicle with a bomb could park beneath to blow up the building. I use the past tense because the building no longer exists.

When I think of a barracks, the first thing that comes to mind is *Hogan's Heroes*. I usually imagine a small rectangular building that holds about a platoon full of soldiers or a bunch of small rectangular buildings in a large camp or military base. The so-called Marine barracks in Beirut looks to me more like some cheap abandoned building the military could get at low cost to shove a bunch of Marines into to be able to state America now had a military presence in Beirut. There was no large camp or other large military base with military activities ongoing.

My next observation is that there was no battle or fight to gain the grounds and to achieve the barracks. The Marines pretty much just moved in; and just like that, America had a military presence in Lebanon, and the American military had managed to make the president happy. I use the word *managed* because the American military seemed to have managed the situation but did not take the initiative to lead in the situation.

How many college students from a lesser university does it take to screw in a light bulb? Usually quite a few? How many soldiers does it take to convince the enemy you have four hundred soldiers stationed at a location? History tells us that sometimes it only takes a few. I thought the military was big on tactics and deceiving the enemy, on pretending and fooling the enemy. Was all that forgot-

ten? There were some omens and words from the enemy that the American soldiers were in a hostile environment and not in the Conrad Hilton, correct?

So here is what I am thinking: The president wanted a military presence in Beirut on Lebanese soil. You were stuck with a big unsecured building and a small amount of grounds around that building. I am thinking about two platoons, or twenty-four soldiers, were all that were needed to convince the enemy that four hundred troops were on location. The troops arrived in great fanfare. Four hundred troops are stated to have arrived, but really only about one hundred arrive. Several Chinese fire drills occur for the press to tell the world four hundred American troops are now in Lebanon and stationed in the Marine barracks. But of the one hundred troops that arrive, all but one platoon get right back up on the buses or helicopters and head right back offshore.

A few tents for supplies are erected, and this is where the few platoon members actually stay, since the enemy might target the so-called barracks, and actually, the platoon digs a bit underground in a bunker disguised beneath a supply tent. During the day, two platoon members use the buddy system and go into the large Marine barracks building turning on lights, turning off lights, turning on stoves, turning on the shower water, etc. I think you get the big picture now. Then one day, a suicide bomber breaks through the barrier and gets below the building and blows up the so-called barrack building.

President Reagan is briefed that the Marine barracks and French barracks in Lebanon have both been bombed and that both buildings are completely destroyed. He prepares for the bad news regarding casualties. Finally, the news comes. One American dead and one wounded. The president, vice president, and cabinet members are all amazed, especially when they hear fifty-five French paratroopers have perished in their building or so-called barracks.

"How did you do it?" President Reagan asks the military brass.

"We just did what you would have done, sir. We fooled the enemy like we are supposed to do."

"Well, you fooled me too. And I am sad we lost a soldier, but I have never been so happy to be made a fool of in all my life! Great military strategy and planning! It could have been a lot worse if you had simply taken my order at face value. I'm sure as hell glad you didn't and did led your troops in that hostile environment. We should have put you out in the countryside with more room to spread out. Sorry, but that was political."

"We kind of figured that, sir. We knew you just wanted us to be there, and we knew you did not want anyone to get hurt if possible. Plus our hands were kind of tied on being able to open up and fire upon anyone, so we thought this was the best plan."

"Well, whatever you are doing, keep doing it. You sure make my job a lot easier in this Oval Office and keep the few black hairs on my head from turning grey like the rest. And by the way...go ahead and load everyone's weapons up now. Sorry I tied your hands on that. I should have trusted you to do your job."

When Success Is Not Quantified
Piper Alpha and the Deepwater Horizon

Fuzzy Wuzzy and the Deepwater Horizon blowout preventer have something in common—namely, that Fuzzy Wuzzy wasn't fuzzy, was he? And the Deepwater Horizon blowout preventer wasn't a blowout preventer, was it? If Fuzzy Wuzzy could have just done a simple verification test before presenting himself (or herself) in public, Fuzzy Wuzzy perhaps could have realized he (or she) was not fuzzy. In similar fashion, if a verification test could have been performed at a critical point in time, after which nobody is allowed to monkey with the pipe and blowout connection joystick, the Deepwater Horizon crew could have realized their blowout preventer was not a blowout preventer after all.

There needs to be a Fuzzy Wuzzy—critical assessment test for all critical safety devices and critical decisions to assure the integrity of the devise is clear and not fuzzy. If possible, critical decisions should be eliminated and replaced by engineering controls, like locking cockpit doors on commercial airlines. Along with locking cockpit doors, airlines could add a pilot and copilot identification and verification system someday. After the blowout preventer was inadvertently operated at some point prior to the Deepwater Horizon disaster, chunks of the blowout preventer seal were observed by workers spilling out at deck level. There was probably no procedure to document this anomaly, to assign the risk, and to go investigate and assure the blowout preventer seal was still intact.

There are some risk management decisions that are so important a lockout tag out or even higher energy and risk-control procedure must be used. In the Piper Alpha disaster, there was an energy control system in place, but that system was not used appropriately. Likewise, the movement of the blowout preventer should not have been allowed unless unlocked by the company president or blowout preventer inspector or officer or designated expert (there, apparently, was not one) because the risk was at the highest level of required acceptance needed.

Observed or not observed, at any time, if the blowout preventer is operated, Fuzzy Wuzzy needs to verify if Fuzzy Wuzzy is still fuzzy or not. Perhaps this heavy and expensive blowout preventer device needed a high-pressure helium-compressed gas system with a double block-and-bleed system to inject a helium gas sample into the well at some pressure. The helium could further have a methyl mercaptan additive just like natural gas to make a pungent odor. A small gas sample would be injected and then a helium leak detector installed at the deck level and other points to detect a helium leak, if any. Also, the methyl mercaptan would stink and might be smelled by deckhands if there was a leak. Some type of verification is needed to allow the oil-rig management team to have a completely clear and not fuzzy picture of what is going on down at the blowout preventer.

The other possibility of the blowout preventer is for the blowout preventer to work no matter what. In this case, Fuzzy Wuzzy is always self-aware and sure that Fuzzy Wuzzy is fuzzy or not fuzzy. The blowout preventer must either be foolproof or verified functional before use. Keep in mind there are many James Bond movies in which the antagonist says "Goodbye, Mr. Bond," assuming the foolproof James Bond destruction device will work, only to find Mr. Bond is still alive and well.

There is a safety video that was produced following the Piper Alpha disaster entitled "Spiral to Disaster." Two things amaze me regarding the Piper Alpha disaster video: One is how grungy and greasy the Piper Alpha oil rig actor workers look. I hope this was for dramatic effect only and not to portray actual working conditions. Don't they ever wash their clothes? Secondly is how the rescue ship

right next to the Piper Alpha could not be used due to a hydraulic system mishap. Amazingly, the last workers to leave the Deepwater Horizon could not untie their rescue boats and leave the Deepwater Horizon as they were apparently not allowed to carry knives. Luckily, a fisherman from a fishing boat nearby was able to throw a knife to the workers so the workers could cut the rope and escape the disaster.

Thus it was readily obvious to me that not many people involved with the Deepwater Horizon disaster had ever watched the Piper Alpha disaster video and implemented any of the lessons to be learned. When the Piper Alpha disaster occurred in 1988, a rescue ship was right next to the Piper Alpha that was described as "a godsend," but the rescue ship was not able to be used due to a hydraulic failure. One hundred sixty-seven people died in the Piper Alpha disaster. Thirty-two years later, in 2010, rescue boats for the Deepwater Horizon were not able to be used as the rescue boats were tied up and none of the evacuees had a knife to cut the ropes. The permit system to operate critical equipment was not adequate in the Piper Alpha disaster. Thirty-two years later, the permit system again proved to be inadequate when the piping system was operated while the blowout preventer was being deployed, resulting in damage to the blowout prevented.

I think a good place to begin a Deepwater Horizon "lessons learned" video would be with the safety ceremony held on deck just before the disaster. My gut instinct tells me the highlights of the safety ceremony will reveal just how out of touch the highest BP management team was regarding analyzing and managing risk. The Deepwater Horizon "lessons learned" video should also reflect back upon the Piper Alpha disaster and disaster video to show how little was learned. Considering how little NASA learned from Apollo 13 and how little was learned from the Piper Alpha disaster, it seems NASA at the time of Apollo 13 and BP at the time of the Deepwater Horizon both had infant management systems in place.

There was actually a lot of pride among the rig workers considering the Deepwater Horizon was on schedule with apparently very low accidents or injuries. Everything seemed to be proceeding safely. But the device that mattered the most regarding safety was not

verified to be functional and was without redundancy. NASA tried to demonstrate pride before and following the Challenger disaster.

The Titanic was thought to have independent compartments able to keep the Titanic from sinking, but the Titanic rivets were similar to Fuzzy Wuzzy—not verified as having adequate strength, resulting in the side of the Titanic simply popping off when struck by an iceberg, similar to buttons of a shirt that is getting pulled apart.

The Exxon Valdez

The safety ceremony just prior to the Deepwater Horizon indicates two things: For one, the safety ceremony indicates how far BP and the oil industry have come regarding understanding and managing risk. For two, the safety ceremony indicates how far BP and the oil industry still need to go regarding understanding and managing risk. Leadership will be required to step forward.

Following the Exxon Valdez oil spill in 2005, BP clearly identified an oil spill as the single biggest threat to the finances and reputation of BP. This included the use of double-hulled oil tankers for BP Alaska. The concept of independent redundancy to assure success for highest-risk operations is being found in all industries and organizations and their machines and bridges and all gadgets.

Thus it appears BP took the first step in assessing the highest threat and risk to business. But the next step of understanding and analyzing the risk did not happen, as validated by the Deepwater Horizon disaster.

Two Texas City Explosions

There have been two memorable explosions in Texas City, Texas. The first explosion was around the end of World War II. A first explosion caused a chain reaction of explosions. Thus the need for distance and barriers between hazards when possible. The Bhopal, India, disaster is another case where some distance between the chemical plant and slums and masses of people could have prevented a high death rate. But sometimes, just like astronauts in the Space Shuttle era, lives still do not seem to matter as much as others.

The second Texas City explosion was at a BP plant. The process control was not modernized with time, and increasing risk was not properly assessed. A risk assessment might have corrected the process control problem, but only if the risk assessors were to keep coming from the outside and were knowledgeable regarding process control. I do think the workers killed in the break shack near the vent tower might have been saved if a good auditor from outside the plant had studied the system. The Japan nuclear power facility built next to the ocean that was struck by a tsunami is another example of the need to consider proximity and barriers regarding initial construction and potential expansion.

Audits, inspections, and hazard assessments are snapshots in time. As time passes, organizations and businesses tend to grow. Just as people can become sensitized to some chemical compounds, people can also not be aware of the change that has occurred right by them and the associated increase in risk. Not only should hazard assessments be updated periodically or when change has occurred

but also the new assessment should be performed from scratch and by a new assessor. Only when complete should the new assessor compare the new assessment to the existing assessment. The same goes for inspections and audits.

There are all types of inspectors, safety assessors, and auditors. I always like what I call the new buzzwords of quality, such as *cheaper, better, faster*, which is actually a very old slogan. *Empowerment* is another word that caught on in the early twenty-first century. But do you really want to empower loose cannons when it comes to inspectors, assessors, and auditors? There needs to be some control and decision-making over the inspectors, assessors, and auditors. Immediately, someone will think I am downplaying the need and ability of inspectors, assessors, and auditors. On the contrary, I think these people should not be held back, but someone who can make a leadership decision needs to oversee the process being managed by managers and people.

I wrote this story, case in point, to describe the problem of accepting welds and the welding process. Welding is a great joining process, but some designers refrain from using welding because of all the potential problems associated with accepting a weld. The welding process needs to be specified and proven to work, the welders need to be qualified, the weld inspector needs to be certified, and the weld engineer should be capable of assessing the welding process. The welding engineer really needs to step up to the plate, otherwise the inspector runs the show and rejects acceptable welds. How can this be? Consider this story.

Once upon a time, a welder, a weld engineer, and a welding inspector walked into a furniture store and saw their spokesperson. She was very beautiful, nearly perfect, except perhaps for a large mole on her face. The weld inspector looked at her and said, "Defective. That mole on the face is a defect. All defects must be removed."

The welder said, "I disagree. If that was a weld, I think the weld would be perfectly good as is. That is a blemish, not a defect. What do you think, engineer?"

The engineer said, "I don't know." The engineer was afraid to make a decision. He thought, *Whatever I say, one of you is going to*

get mad. And I don't want to make anyone mad or actually have to make a decision, especially when there appears to be no reason to have to make a decision. I get paid, just like a manager, without having to make decisions.

This is also a problem with managers in general. Managers are afraid to make any decision. When times get tough, managers tend to retreat even further to the social network, hoping some other manager or leader will step forward to make a decision for them. Once the decision is made for the manager, the manager can step in and pretend to be a leader and direct everyone and tell them what to do. Everyone thinks the manager is a good leader, but the truth is the manager is just managing and really not that effectively. Management retreats are common. Management advances never happen.

Process audits are usually feared and not wanted. Those being audited usually want a heads-up of what is to be audited and who the auditors are. The auditors show up and look at some specifics to go through the motions and make everyone happy the audit went so well. The opposite should be true. The process owners should look forward to an audit. The process owners should be happy there is someone, hopefully with recognized expertise, coming in to audit the process and system. The auditor should look at the big picture as well as some important specifics. For example, the auditor might need to verify the energy-control program is in use and confined-space entry procedures followed. The auditor probably does not need to enter the vessel to verify actual oxygen-breathing measurements.

I once worked at a location that had a building that had a wooden cooling tower to support the building. The wooden cooling tower was shut down and drained. For two years, the cooling tower sat dry. A draught hit in the second year of use, and the cooling tower was bone-dry. One a week for two years, the safety and fire protection surveillance's highest contract management drove past the cooling tower. Then one day, a worker threw a cigarette butt on to the cooling tower, and the cooling tower went up in flames like a perfect bonfire. Luckily, nobody was injured. If the safety contractor is penalized, is this not a reflection upon the owner or owning organization as well? Thus the huge bonfire event is downplayed.

The safety and fire protection surveillance contractor is awarded the full contract award fee even though, in hindsight, the dry cooling tower was the highest fire risk at the site and not identified in any hazard assessment. I think a levelheaded auditor from the outside might have passed by the cooling tower and asked a few questions and recognized the cooling tower was an extremely high fire risk. It is good to have new inspectors, assessors, and auditors and to not let these people become so conditioned to a location that they become numb to the ongoing change all around.

The Piper Alpha rig added natural gas production, and the safe haven was not moved and was located right above the natural gas well. Was this change increasing risk to personnel not assessed? Many manufacturing facilities grow but do not increase utilities to keep up with demand. Is it really so surprising when the electrical provider one day cannot provide electricity and the entire operation gets shut down because the backup electrical generators do not work or do not have adequate capacity or have a similar problem?

Quality Philosophy Reconsidered

Quality got a big push in America in the 1980s. The quality of Japanese cars in the 1980s was generally considered better than American-made cars. Three changes in America occurred to deal with and end the quality push. One change was to understand and to implement quality concepts. The second change was to outsource as much labor as possible to nations where cheap labor is available. The best way to deal with a labor union is to not need the labor, in other words. The third change to end the quality push was to get an ISO-9001 or similar quality certificate. Managers want the third change. With a certificate, quality is proven achieved, and quality philosophy is then no longer necessary for a manager. A leader would prefer the quality philosophy instead of a quality certificate.

One of the quality philosophers of the 1980s' quality big push was W. Edward Deming. The 1980s' quality big push became a great opportunity for him to sell his book *Out of the Crisis* for $45 dollars a pop. Now that's what I call achieving quality in the 1980s—selling your hardcover book for $45 dollars. That is about as good as college professors today who slightly tweak and change each new edition of their required college textbook and then charge over a hundred dollars for the required textbook.

Deming had twelve quality points. His second point is vague and is the same as the seventh point, which is that leadership is needed to supervise management. I know we want to achieve quality, but that is just part of the bigger picture and equation to want to achieve success. Philip Crosby states quality is measured in cost,

but what about success? I have come up with twelve modified points aimed toward achieving success, which I hope will be questioned and modified again and again:

1. Put safety and health first. Replace safety talk with engineered design controls and safety processes.
2. Try to define and to achieve success. Question your sense of purpose and ethics.
3. Do not assume. Know what is critical to achieve success.
4. Leadership is required to make change. Otherwise managers can react and manage.
5. Plan for the future.
6. Communicate as directly and as simply as possible, like an umpire or referee.
7. Follow and constantly update procedures, drawings, analysis, processes in a world of change.
8. Encourage people to think and to move outside the box. This includes tolerating creativity, imagination, vision, dissent, and disobedience. Disobedience must not break ethics rules, but ethics is supposed to allow discussion and alternative views and accept criticism.
9. Does everyone know what they are supposed to be doing and why?
10. Apply applicable lessons learned and train with a purpose to achieve success.
11. Continuously improve.
12. Cease dependence upon inspection to achieve success.

Alfred Nobel's Peaceful Balance of Terror

In the twenty-first-century age of terrorism, we can reflect upon Alfred Nobel and what is known as his peaceful balance of terror. Alfred Nobel is best known for inventing dynamite and for initiating the Nobel Peace Prize. Alfred Nobel may have thought his dynamite invention would lead to weapons so powerful and so horrific that just the thought of the damage such weapons could do would end all war and hostilities. Alfred Nobel created the Nobel Prize when a newspaper false obituary declared him "The Merchant of Death," stating in the obituary that he became rich by finding ways to kill more people than ever before. In truth, however, it seems his invention has simply allowed the upper limit to what is considered kosher, ethical, and humane when it comes to the preferred method for the mass killings of human beings.

The three categories of weapons of mass destruction are chemical, biological, and nuclear. Somehow, the MOAB (or massive ordinance air blast or mother of bombs) and Russian father of all bombs, which are built with an explosive based upon Alfred Nobel's dynamite principles, evade the list yet massively destructive. MOAB and dynamite and similar weapons, though massively destructive, are called conventional.

Chemical weapons were used in World War I but not in World War II. Seems Adolf Hitler was poison-gassed in World War I and refrained from using poison gas in World War II. What a nice guy. I doubt Hitler would have used the word *kosher* to describe the limitation he made when killing masses in World War II, but in "his

struggle," he refrained from using chemical weapons. The longest conventional war of the twentieth century between Iran and Iraq was not so conventional after all, as the Iraqis used mustard gas on their own divided people. Biological weapons have been developed but, apparently, have not been used on a massive scale, perhaps not since heads of plague-dead humans were launched over castle walls in the Middle Ages. Thousands of nuclear weapons exist, yet nuclear weapons have only been used twice in war (on Hiroshima and Nagasaki in World War II) but many times in tests. There have been a lot of close calls regarding near nuclear weapons accidents and near accidental use and several nuclear power plant accidents.

As humanity goes or even progresses into the future, say for the next ten thousand years, what can we see regarding the peaceful balance of terror? At the individual level, civilized and organized societies have done away with the guillotine and the electric chair. These methods are not humane or conventional and have been replaced with painless lethal injection methods in most societies that have progressed past the medieval era. With thousands of MOABs and other conventional weapons, it seems the civilized and organized societies will no longer need the unorthodox, unconventional weapons of mass destruction, but centuries of a stable world and a stable world population may be necessary to achieve nuclear-free and tyrant-free management of nations around the world.

As humanity enters the twenty-second century, perhaps all killings, whether at the individual level or on the massive scale, will (for the most part) use noble Alfred Nobel—conventional and kosher-limitation methods. Hopefully by then, the individuals of the world will not, through sensationalism, be persuaded or taught or made to focus on the potentially ugly and harmful side effects of killing and the pain and torture of killing. Hopefully by then humans will be able to simply focus on why humans are killing each other in the first place.

Socrates considered himself to be a citizen of the world. Hopefully, by the twenty-second century, the citizens of the world can constantly question and remove the bad leaders and visionless managers from all of the world's powerful organizations. Maybe future

humans can have leaders and managers who can focus on stabilizing the world population, exhibiting national restraint and self-control, focusing on internal improvement, and allowing and promoting protest and disobedience. As individuals, we should be thankful and, at the same time, skeptical of all the applied technology that humanity has achieved. There are a lot of obese people who do not exercise who do not necessarily need power steering and an elevator when they travel to and from work. Humanity needs to question and challenge the purpose of all the leaders and managers of powerful organizations who use that applied technology and question their authority and authorization to do anything other than to allow disobedience and protest and to uphold the "sanctity of life" principle—a principle that will hopefully be taught in an ethics and morality grade-school class just like basic mathematics and language and, hopefully, taught soon.

About the Author

Paul Torrance is a chemical engineer who grew up the son of a capitalist father. His father worked as a chemical engineer and plant manager for a large chemical company. Following in his father's footsteps, the author worked many capitalist jobs including working at restaurants and as a pipe fitter while in school and then for a chemical company upon graduation from Texas Tech University in 1983.

Considering pursuing a master's degree in cosmology or philosophy, he interviewed with NASA and, in 1985, began the first socialist job of his life working as a civil servant at NASA in advance life support in the crew and thermal systems division at the Johnson Space Center. Within a few months of hiring in at NASA, the Washington, DC, politicians decided to move the space station life-support work to the Marshall Space Flight Center, leaving the author in a fairly empty socialist box. Fortunately, there was an opening in the quality organization at NASA at this time, allowing the author to transfer to a new socialist box.

In the 1980s, it was readily evident that American gas-guzzler cars could not compete with Japanese cars, and quality was becoming a buzzword and receiving attention not only among the capitalists but also in the socialist bureaucracy known as NASA. The author became a learned and applied quality engineer and worked space shuttle and space station subsystem quality engineering problems. With his experience working outside socialism and with his knowledge of the 1980s' quality engineering and quality management fundaments and quality engineering work in the space shuttle trenches,

the author is able to provide a unique firsthand insight into the dark side of an American bureaucracy, the dark side of NASA. The author is success driven and has provided insight and case studies for managers who want to learn to become leaders.

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